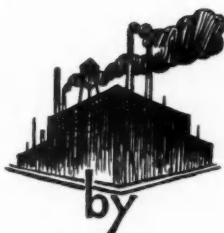




Litigation Tangles New York Truck Market

Matter of "assemblers" vs. "manufacturers" involves huge fleet order



by
E. K. Titus

ONE of the liveliest and most significant specification debates in recent years is being staged in New York City. "Manufacturers" and "assemblers" of trucks, on opposite sides of the rostrum, have been using affidavits for ammunition.

Affidavits, representing the experience of some of the most distinguished figures in the automotive industry, probably make the best encyclopedia of opinions on the relative merits of the two methods of production ever collected.

The prizes being contested for are millions of dollars. New York City is expected to spend on trucks during the next few years. The immediate issue was award of contract for nine motor-driven brooms. Brockway Motor Truck Corp., as a taxpayer, was suing the City of New York, and members of the Sanitary Commission, in an effort to secure modification of the specifications for this equipment, to admit assembled trucks.

Supreme Court Justice Salvatore Cotillio on Nov. 27 handed down an opinion declining to issue the temporary injunction restraining the department of sanitation from specifying a "manufactured" truck, taking

this course on condition that the case be set down for immediate trial on Dec. 7.

He declared, however, that the Brockway counsel had presented "powerful and almost irrefutable arguments to sustain its contention of

abuse of discretion resulting in probable waste."

The disputed clauses in the specifications follow:

"3. (a) That the chassis furnished by the successful bidder on this contract shall be the product of a manufacturer who meets the following conditions:

"d. That the manufacturer of the chassis has in operation a factory adequate for and devoted to the manufacture of the motor or engine, transmission, front and rear axle, which it proposes to furnish in the chassis.

"h. That the manufacturer of the chassis has been engaged in the continuous manufacture and advertised sale of motor trucks for at least 10 years."

Under the conditions, declared Joseph L. Greenberg, attorney for Brockway, the charter of the city is being

violated, because these conditions are arbitrary and do not afford full opportunity for open, free and competitive bidding, but limit the bidders to a class, causing the price to be maintained in excess of the open market price.

Not more than four motor-driven broom manufacturers will qualify for submission of bids and the acceptance of bids thereunder, notwithstanding the fact that there are more than 30 motor truck manufacturers who would be capable of furnishing proposals to the City of New York.

The specifications, the attorney held, were "artfully drawn" to exclude Brockway, and unless they were modified, he declared, there would be a "fraud on the taxpayers."

When bids were opened, it was found the following unit prices had been offered: Four Wheel Drive Co., \$8,350, terms 2 per cent; White Motor Co., \$7,082, terms net; Russell Snow Plow Co., \$7,025.50, terms 2 per cent; N. P. Nelson Iron Works, \$6,350, terms net. Award was delayed.

Later Brockway filed for the record a letter from Daniel Dickenson, secretary-treasurer of the Russell Co., stating the company could have bid under the low bid had it been able to order an assembled chassis. Mr. Dickenson said the 20 snow brooms bought by the city from his company in 1928, and equipped with Brockway chassis, were giving good service.

Major Emil Leindorf, who has charge of sales to municipalities for Brockway, in a supporting affidavit, said:

"I have discovered by checking 5-ton trucks advertised in the *Commercial Car Journal*, a Chilton Class Journal publication, and the most important periodical in the industry, that only four truck manufacturers could qualify, and then they would have difficulty in meeting in toto the specifications set forth by the Department of Sanitation."

"The requirements for bidders will necessarily cause the bids to be higher," said Robert F. Black, president, Brockway, "and it will enable the bidders to control the prices between them. Deponent therefore believes that an injunction should issue out of this court, restraining the defendants from carrying into execution any plan or device with respect to the aforesaid purchases, and directing the defendants to issue a call for proposals to furnish motor-driven brooms to the City of New York, which shall include all manufacturers on a basis where competition will be open and free, and the city will derive the benefit of the low market therefrom."

\$2,500,000 Order Involved

While the immediate object of Brockway's suit was to open specifications on the nine brooms to assemblers, the larger issue concerned purchase of 500 dump trucks with covered bodies at an estimated cost of \$2,500,000. The Department of Sanitation had this sum available. It must be spent before the end of 1931, or revert to general city funds.

The result of the suit, moreover, was expected to affect specifications for some of the other millions of dollars worth of trucks that New York City buys in the course of a year. In addition, purchasing officials of many other cities might incline to follow New York's lead. The precedence set in this case will be, therefore, of great importance.

Early in the year, the Sanitary Commission spent a million dollars for 205 Autocars. While there were

a number of bidders, the sanitary authorities stated their specifications had called for a "manufactured truck."

In July, Dr. Schroeder held a hearing on specifications for the \$2,500,000 worth to be bought later. The tentative specifications distributed called for a "manufactured" truck.

Representatives of practically all the leading producers attended the hearing. Most remained silent. An unattached engineer from the borough of Queens and several association people spoke. As a result Dr. Schroeder indicated he might modify the specifications. It was while the producers' representatives were awaiting final specifications on the \$2,500,000 fleet that the department, seeking bids for the comparatively insignificant lot of nine motor-driven brooms, specified a manufactured job. Brockway's suit followed.

Decision Reserved

Justice Cotillio heard the arguments and reserved decision. The avalanche of affidavits followed. On the side of the "manufacturers" there were those of A. F. Masury, chief engineer of Mack Trucks, Inc., and Arthur J. Scaife, consulting engineer for White Motor Co.

The arguments of the "assemblers" were presented in affidavits by H. W. Alden, chairman, of Timken-Detroit Axle Co.; Martin L. Pulcher, president, Federal Motor Truck Co.; William R. Angell, president, Continental Motors; W. Ward Mohun, assistant sales manager, Willys-Overland, Inc.; Eugene B. Clark, president, Clark Equipment Co.; L. P. Kalb, former chairman of the Truck Standards Committee of the Society of Automotive Engineers; R. G. Stewart, vice-president and chief engineer, Stewart Motor Corp.; C. A. Peirce, chief engineer, Diamond T Motor Car Co., and Charles Balough, president, Hercules Motor Corp.

All of the assemblers' affidavits were submitted after and were replies to the affidavits of Mr. Masury and Mr. Scaife. Mr. Masury said in part:

"Your deponent states that from his experience in the automotive industry he has found that an assembled motor truck or chassis does not give satisfactory service as a vehicle of conveyance or transportation, for the reason that the units thereof (motor, transmission, axle, etc.) are of unstable quality and quantity, often rearranged, switched, and misplaced, in order to meet a price. In other words, an assembled truck is not a coordinated unit of machinery.

"The companies producing assembled vehicles are transient in life, often unstable financially, and in most instances insolvent, thus leaving the purchaser of an assembled truck in a year or so with orphan mechanical equipment. This means that individual repair parts have to be made up, one at a time, to fit into the units which have gone completely dead, subjecting the purchaser of an assembled truck to the practice of 'pirating of parts,' i. e., the selling under false representation of inferior parts.

"In order to service the assembled trucks, the purchaser thereof is not dependent upon a reputable manufacturer who has a constant supply of repair parts on hand, but is forced to go into the open market to secure from miscellaneous parts dealers the necessary repair units. These repair parts dealers have no interest in the trucks themselves, but are simply interested in selling these inferior parts

for a price measured simply in dollars and cents. This necessarily raises the cost of repairs to a very high figure.

"The makers of assembled trucks in general do their business through dealer organizations, instead of through factory branches, which is the practice of truck manufacturers; thus a purchaser of an assembled truck has not a responsible business organization of stable character through which to service his trucks, i. e., the ability to furnish repair parts at minimum cost and with speed.

"It is well known in the automotive industry that a maker of an assembled truck has to buy his units as they are made and manufactured by the unit manufacturer, and he has no control over the changes in material and specifications which the assembler may see fit to make in order to meet the demands of the trade."

Mr. Scaife, consulting field engineer for the White Motor Company, said in part:

"It is my opinion that a manufactured motor truck is superior and will give greater satisfaction from a user's standpoint than an assembled truck. A manufactured truck is engineered to give uniform performance in all of its component units, such as engine, transmission, axles, frame, steering gear, etc., due to the coordinated engineering calculations made at the time of the vehicle's design, proved by extensive experimentation and testing, extending over a period of years.

"It is very difficult to incorporate this feature of balanced engineering into an assembled truck, due to the principal units being designed and manufactured by different engineering groups. As all engineering is a compromise, it would be practically impossible for each one of the engineering groups represented in an assembled truck to produce a completely balanced vehicle."

Many of the affiants replying to Mr. Masury and Mr. Scaife held that the distinction "manufacturers" and "assemblers" was inconsistent, and that this method of distinction might well be discarded in view of the fact that even the "manufacturers" purchase certain component parts of their product.

Mr. Clark of Clark Equipment pointed out that his company had manufactured major parts for trucks for 19 years. He denied that so-called assemblers were "transient in life" or "unstable financially."

"Statistics prove," he continued, "that while in the early days of the industry most trucks were of the so-called 'built-under-one-roof' type, the tendency in recent years has been toward trucks designed and built to use units produced by specialists in the manufacture of such units.

"A vehicle builder who would close his doors to the advance in the art of producing the component

parts would soon find himself producing a vehicle with obsolete parts.

"To build and design bodies and to market trucks is a full-sized job for any company. If in addition to this task a truck builder undertakes to compete with scores of large companies which devote their attention to design, construction, improvement and manufacture of component parts, then indeed the truck builder has undertaken more than he can accomplish.

"The reason that the great bulk of modern trucks are built to use purchased units is not only because specialized units are generally superior but also because they are cheaper.

"These facts account for the rapid and continuous trend during recent years toward what is improperly designated as an 'assembled' truck.

"As evidence of the trend that has gone on during the past ten years, it is to be noted that the percentage of the total trucks produced by the two builders who have advertised their adherence to the principle of 'building under one roof' has been steadily declining. For instance, in 1920 these two manufacturers produced 12.9 per cent of the total trucks produced (exclusive of Ford); in the first nine months of 1931, they produced only 2.8 per cent.

"Thus in a decade the total truck business obtained by the 'built-under-one-roof' builders has fallen to 22 per cent of what it was in the beginning; if the Ford production be included (Ford not being a built-under-one-roof truck), the figures are still more unfavorable to these two builders."

Mr. Pulcher "most emphatically" stated "that units of the assembled motor trucks now being sold by responsible manufacturers are not of unstable quality, and he knows of none that are rearranged, switched, or replaced to meet any price, as is set forth in the affidavit of A. F. Masury. This deponent states that the companies producing assembled vehicles are not transient in life, nor does he believe them to be 'often unstable financially.' They are certainly not, in most instances, insolvent.

"The deponent cites the following well known and financially responsible companies which sell so-called assembled trucks and vehicles: International Harvester Co., Reo Motor Co., Chrysler Motor Corp., and General Motors Truck Co.

"In the opinion of this deponent the motors of the Continental Motor Co. are at least equal to any other motors, and the axles of the Timken-Detroit Axle Company have long sustained a position in that competitive field as good as those of any other company. Their integration in a truck is a guarantee of its efficiency, its economical manufacture, and its continued operation.

"The deponent Masury states that assembled truck
(Turn to page 917, please)

Steel Orders

More than three-quarters of the steel and steel alloy requirements for the automotive industry for 1932 will be placed with steel mills within a few days.

Chevrolet and Ford plan to release orders for December rolling.

Our annual survey of metal markets for 1931 and an outlook for 1932 appears in *Automotive Industries*

Next Week

Photo-Tubes Have Wide Field in

Vast majority of applications fall into two classifications: one in which a Thyatron is used to govern electric current and the other in which a photoelectric tube acts as a relay to control an operation

by B. S. Havens

General Electric Co.
Schenectady, N. Y.

BECAUSE photo-tubes are so unlike the control devices with which industry has long been familiar, their introduction into industrial operations was to a certain extent enshrouded in an atmosphere of mystery and it was generally believed that an understanding of their principles required a highly specialized knowledge.

The occasion for these false impressions was later removed by the standardization and production of complete electronic control devices in unit form, which has made their adaptation to average industrial applications as simple as that of any other standard control device. As the result, many hundreds of photoelectric relays are now in use for various industrial purposes, and a large number of applications of Thyatron tubes have been made.

The success that has attended these many applications of the electron tube has demonstrated the device to be a decidedly useful industrial tool, but the full extent of its possible utility is still only faintly recognized. Because of its flexibility of adaptation to a wide range

of control purposes, it has a potential usefulness in practically every industry, and therefore there remains but for each industry to give consideration as to how it can utilize this new control device.

To facilitate the making of such a study, this article contributes a review of some of the industrial types of photo-tube installations that are now in operation. These furnish examples of what such tubes can do and will undoubtedly suggest other types of applications that have so far escaped attention.

The vast majority of tube applications fall into two general classifications: (1) those in which a Thyatron tube is used as a valve to govern the amount of electricity fed to motors, lights, or other devices, and (2) those in which a photoelectric tube, acting as a relay, controls an operation, such as counting, starting or stopping motors, lighting signal lamps, etc.

The utility of a Thyatron tube depends upon its ability to pass current of large amounts whose magnitudes may be accurately controlled by an electrode. This control may be exercised in either of two ways: (1)

by the application of a voltage of predetermined magnitude to the grid of the tube, to start or stop current flow, or (2) by changing the phase relationship between the grid and anode (with alternating current applied to the grid), to govern the average amount of current.

Practically, this means that the Thyatron tube can be used to start or stop electrical operations, or to control them during operation. A simple case of the start-stop control is furnished by a demonstration installation of an automatic door-opening mechanism in the research laboratory of the

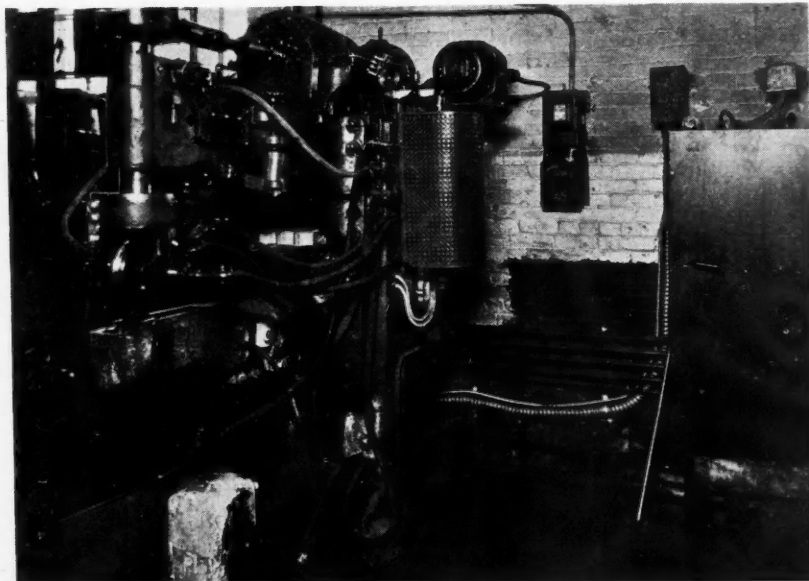


Fig. 1—Intermittent and line-welding machine equipped with Thyatron control. The control panel is in cabinet at right

Plant Operations

General Electric Co. This door may be opened by merely tapping with the hand on a metal plate, in the wall outside, in accordance with a definite code. Each time the plate is tapped the electrical capacity of the tapper's body results in a voltage of sufficient magnitude being impressed on the grid of a Thyatron tube to cause the tube to pass current and set coded relays to work. If the tapping has been done correctly, the final relay will function and cause a motor-driven mechanism to open the door.

An industrial application of this principle is found in the control for intermittent line and spot welding machines, Fig. 1. Very high speeds of interruption are made possible by the use of Thyatron tubes—a thousand or more interruptions a minute being entirely feasible. In the welding machine application, the Thyatron tube acts as a relay which has many advantages over the mechanical type, because it has no inertia or opening and closing contacts to stick, burn, or wear away. The latter item is an important one, for replacements of contactor tips must be made on every eight-hour shift in some installations.

In this case the control is obtained by means of a motor-driven cam switch in the grid circuit of the Thyatron tube. The motor is run at the speed at which it is desired to make the welds; and the cam switch intermittently imposes a voltage on the grid, thereby causing the tube to pass current intermittently. The passing of current acts as a short circuit on one winding of a series transformer, thus varying the impedance of the other winding which is in series with the primary of the welding transformer.

An example of the control of electric equipment during operation by means of Thyatron tubes is found in the wire-drawing shops of the General Electric Co. at Schenectady. The wire must be kept at the proper tension while it is being reeled and this tension is maintained by the use of Thyatron control, Fig. 2.

The wire passes from a large reel through the wire-drawing equipment where it is drawn down to the desired size, and thence to a small spool where it is re-

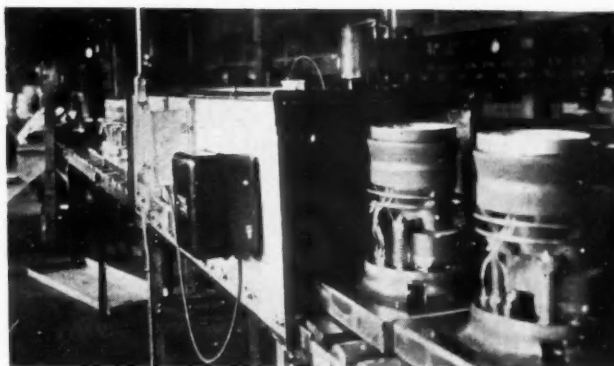


Fig. 3 — Arrangement of photoelectric relay, light source and remote counter to furnish an automatic indication of the passage of refrigerator unit through production

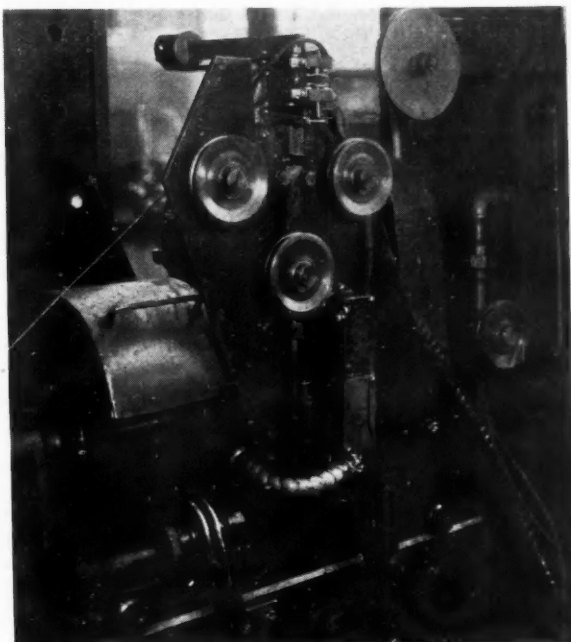


Fig. 2 — The rider pulley and reactor side of the wire-drawing machine which is equipped with Thyatron control of the reeling tension

reeled. As the wire is drawn at a constant rate, the speed of the rereel spool must be constantly decreased to compensate for the increasing diameter of the surface on which the layers of wire are being wound.

The rereel spool is driven by a small d-c. motor, the armature of which is supplied with power by the rectifying action of the Thyatron tubes. A small reactor is included in the grid circuit of these tubes. The reactance of this reactor determines the phase relationship, previously mentioned, between the grid and anode of each Thyatron tube, thus governing the average amount of current rectified by the tubes and consequently the speed of the motor.

The reactance of the reactor is determined by the position of its core which is movable and is, in turn, controlled by the rereeling operation itself because the wire runs over a rider pulley mechanically connected to the reactor core. The loop on which the rider pulley rides decreases when the rereel motor is running too fast, the core is drawn into the reactor, increasing its reactance and causing the Thyatron tubes to pass less current and so causing the motor to slow down. Conversely, if the loop increases in length, the reactor core is withdrawn, thus causing the tubes to pass more current and so increase the motor speed.

A similar application has been made in the process-

ing of rubber by the B. F. Goodrich Co. In a number of the operations, conveyors are used and it is important that the speeds of the various conveyors in a chain be synchronized. On a loop of the material between conveyors, ride wheels similar to the rider pulley in the wire-reeling operation described, and the solenoids actuated by these wheels govern the current rectified by Thyatron tubes and thus synchronize the speeds of the motors driving the conveyors.

Probably the most popular use of electron tubes—and certainly the most diversified in application—is the use of photoelectric tubes as relays to govern industrial operations of all kinds. A photoelectric tube has the peculiar property of passing electric current—weak but still usable—when light falls on its cathode. What actually happens is that the cathode, when illuminated, emits electrons which pass to the anode and thus permit passage of an electric current. This current, if amplified by another electron tube known as a Plotron tube, can be used to actuate a relay that in turn controls the operation of electric devices of various kinds.

From a practical standpoint this means that where the operation of machinery provides—or can be made to provide—a means for interrupting or changing the intensity of light, the photoelectric relay can be used for control purposes. One of the simplest examples of this is in counting. There are a number of counting applications in General Electric plants, a typical instance involving a conveyor in refrigerator production, Fig. 3. As the refrigerator units pass along they intercept a beam of light from a source on one side of the conveyor to a photoelectric tube (in a suitable housing to exclude extraneous light) on the other side. The electrical impulses stimulated in the photoelectric tube are amplified by the Plotron tube to an amount sufficient to actuate an electric counter on the foreman's desk.

A very interesting application was made by the Logan Conveyor Co. In many conveyor installations it is necessary to switch the product from one conveyor line to another. The Logan Co. method is to place two small "flags" or projections in different positions on each container carrying the material over the conveyor line. One photoelectric relay and two light sources are placed near each switching point in such a manner that only the flags in predetermined positions will intercept the two light beams simultaneously, Fig. 4. The relays in turn operate switching equipment which sends the moving material to its proper destination. For example, material destined for *Station A* is equipped with flags set to position *A*; these flags intercept the two light beams *A*, operate photoelectric

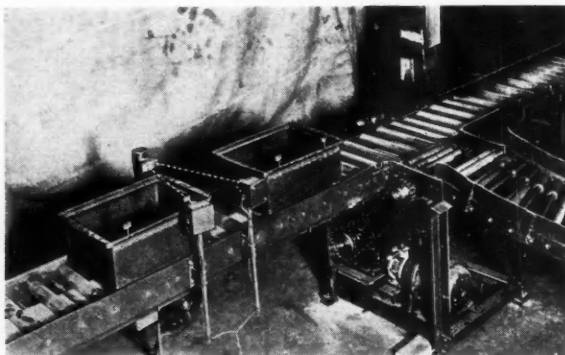


Fig. 4—Photoelectric relay equipment and automatic switching mechanism that determines the path of "tote boxes" on a system of conveyors in accordance with metal "flags" on the boxes

relay *A*, and cause the operation of a mechanism that sends the material via switch *A* to its proper destination. Similarly, material for *Station B* flags relay *B*—not *A*—and is switched accordingly.

Of course there is no necessity for using a photoelectric relay when some other and simpler device will accomplish

the same result. But in every application where the photoelectric device has been employed, some circumstance or set of circumstances made its use essential. In many cases the use of mechanical devices tripped by the movement of material or machinery is prohibited because the material may be too light to apply the necessary tripping force, or may be damaged by the contact, or because some accidental foreign material might damage the mechanism itself. In other cases, space limitations may prevent the use of such a control, and in still others the friction interposed by such mechanical contact may interfere with accuracy.

An example of the latter consideration is found in a densometer manufactured by W. & L. E. Gurley of Troy (N. Y.). This is a device for measuring the compactness of the fiber structure of various kinds of paper, and the test consists of forcing air at a low pressure through a standardized area of the paper sample. The paper is clamped in position and air pressure is applied by an inverted cylindrical cup which moves downward as the air escapes through the paper. The density measurements are very refined and consequently the slightest movement of the pressure cup must be reflected in the indicating equipment. Also the tests must be timed, and the interposition of gears or other mechanical devices for timing measurement would interfere with the accuracy of the equipment. Light, however, offers no resistance to the operation of the device, and a photoelectric relay is successfully used to operate an electric timer. The light beam, supplied by an automobile headlight bulb, is interrupted by a vane on the pressure cup after a definite movement and the impulse is transmitted from the relay to the timing unit in a separate case.

Plating Zinc

THE Plating of Rolled Zinc and Zinc Die Castings is the title of a research bulletin recently issued by the New Jersey Zinc Co., New York, N. Y., the authors being E. A. Anderson and C. E. Reinhard. The various steps in the preparation of the articles to be plated for the plating bath and compositions of baths for nickel and chromium plating are described in detail. The publication is accompanied by a chart outlining the plating procedure.

JUST AMONG OURSELVES

Car Makers in New Parts

PARTS merchandising activities by car factories have definitely entered a new phase during the last 12 months. Car makers are out to *sell* parts to their own dealers. The more progressive and alert manufacturers have stayed awake nights during the last 12 months trying to devise the best ways to do the job. They have long ago given up thinking or talking about where their dealers *ought* to buy parts. They are organizing to make their factories to most attractive places for their dealers to buy from.

The thinking of every factory in the industry has been affected to some extent as regards parts merchandising. But, as in everything else, leadership is being taken by a few. Those few are going to benefit from their straight thinking and definite action, while the Bourbons—"learning nothing and forgetting nothing"—continue to be content with winning the argument and losing the parts business to active, sound operating independents.

Fortunately nobody is hurt except the Bourbons.

The Well Has a Bottom

EVERY time a car manufacturer gets a new merchandising idea, dealers seem to get the privilege of paying for it—

or at least a part of it. Caught between pressure from the factory against padding of delivered prices and continued downward tendencies in discounts, the average dealer has been wondering for a good many years where he's going to get the money to carry out any newly-conceived ideas for giving away more to the public.

On policy replacements alone, despite the payment of half the flat rate labor charges by a number of factories, the dealer still in most cases pays (1) freight charges on defective part back to factory; (2) freight charges on new part back to his service station; (3) part of the labor charge of replacement; (4) the entire cost of the part and labor in case the factory decides not to make an allowance.

And now in addition to these costs he is being asked in more and more cases to make from one to three free inspections and adjustments entirely at his own expense.

And the Owner's Service Policy Will—

THE new standard warranty and Owner's Service Policy just approved by 21 N.A.C.C. sales managers and by the board of directors of that organization won't lighten the load in this respect so far as most dealers are concerned. While the proposed Owner's Service

Policy provides for just one free inspection and adjustment, it is quite likely that the higher priced cars will be found rather generally incorporating promises of two and probably three such adjustments to the new car owners.

In one sense, however, the dealers are really getting a very good break as a result of the adoption of this new warranty, because, had it not been agreed upon, there might have developed some very wild competition in guarantees and warranties. With competition keen and sales managers at their wits ends for new means to move new cars, it was perhaps natural that thoughts should have turned to the old Barnum idea of "Big Free Offer." At any rate, there was serious thought in the minds of some factory executives that they might smother competition with bigger and better warranties by promising the prospective owner more than he had ever dreamed of getting before.

But wiser heads prevailed. It was made clear that such competition could spell only decreased profits for all and disaster for many.

The wild horses were brought under control. This new warranty, sound in principle and differing in minor rather than major respects from the old one, was agreed upon and all promised to be good and not try to give away more than everybody else.—N.G.S.



Sinking Funds Dominate As Engineers Seek Way

Definite sums must be set aside for replacement of equipment, all vocations agree, as 52nd Annual Meeting of American Society of Mechanical Engineers ends broad program in New York

by Joseph Geschelin

INDUSTRY must set aside a definite sum for replacement of equipment, financiers, industrialists, and economists agreed at the 52nd annual meeting of the American Society of Mechanical Engineers, held last week in New York.

Planned programs of replacement will enable a company to keep abreast of technological advances without affecting its financial structure and dividend requirements, and, second, planned replacements will help stabilize the equipment industry, which in turn exerts a profound effect upon general business.

Addresses voicing different angles of attack and analysis of today's problems were made by several well-known speakers. Dean W. B. Donham, Harvard, author of "Business Adrift," chose as his topic "The Temporary Emergency and Twenty-Year Planning" for the fourth Towne Lecture. At the stabilization symposium on Dec. 2 three speakers expressed their views. Paul M. Mazur, partner, Lehman Bros., represented finance; James W. Hook, president, Geometric Tool Co., represented industry, and Virgil Jordan viewed the situation as an economist.

Out of it all come some pretty important ideas. Mr. Hook dealt with the working of his plan for unemployment relief, and since it has been variously described in *Automotive Industries* and the trade press it is perhaps unnecessary to go into further details. Nevertheless, industry may find it well worth studying some of his basic recommendations, particularly those relating to unemployment relief, the dismissal wage and the development of a fund out of profits for stabilizing wages during a depression period.

Mr. Mazur suggested that trade revival may come through a nation-wide building program such as is being advocated by President Hoover, although the plan may require some practical modifications.

One general conclusion appeared to be that future experiment with the leveling of business cycles should be charted along the line of controlling national financial factors and policies. Among these are such considerations as credit control through the Federal Reserve, tariff policies, etc. In this connection Mr. Mazur

pointed out that the Federal Reserve at present controls only about one-quarter of credit activity due to the restriction to short-term borrowing only.

One major key to the situation according to a consensus is the necessity of a new philosophy of thinking along the line of economic business research on a grand scale. Dean Donham expressed this in striking fashion by proposing a *central thinking* agency, national in scope, but not in the nature of a governmental bureau, although the government should be represented. The function of this agency would be to study economic changes, develop indices for financial factors and supply and demand, and report to industry at frequent intervals. Basically the same idea was voiced by Dr. Julius Klein in an article which appeared in *Automotive Industries* early this year.*

Milling Technique

The beginnings of a project designed to develop the variables involved in milling are found in a technical paper, "The Elements of Milling," by O. W. Boston and C. E. Kraus of the University of Michigan. The present paper does not attempt to go into production problems. But it is a forerunner of laboratory and shop tests which may prove to be of great value to practical men.

Both the paper and written discussion emphasized the relative merits of coarse and fine-tooth milling cutters and the advantages of milling down instead of the conventional way. Coarse milling cutters appear to offer greater efficiency under certain conditions when milling in the usual manner, i.e., against the direction of feed. Advantages of milling down (with feed) appear to be two: lower power and freedom from chatter. This seemed to check with the experience of those using the method in production.

* (Stabilization of Industry Will Follow Wage Studies and Marketing Research, July 4, 1931.)

Economic Study To Stability

Discussion brought out the fact that milling machine makers are carrying on considerable research work in the same direction. But their results probably may not be made public until they reach a workable solution.

Hard-Cutting Progress

With the growing commercial importance of the hard-cutting tool materials, everyone is interested in finding, if possible, the sphere of usefulness of each of the tool materials now on the market. The results of an important survey in this field were given in Progress Report No. 3 of the sub-committee on metal-cutting materials of the A.S.M.E., "Tungsten-Carbide and Other Hard-Cutting Materials," by Coleman Sellers, 3rd, of William Sellers & Co., Inc.

Perhaps the most interesting thing about the report is the conclusion that considerable progress has been made in the utilization of such materials as tungsten-carbide, tantalum-carbide, Stellite and cobalt high-speed steel. It is also evident that the importance of machine grinding is being realized. This was shown in the survey, "Proper Grinding Practice Assures Suc-

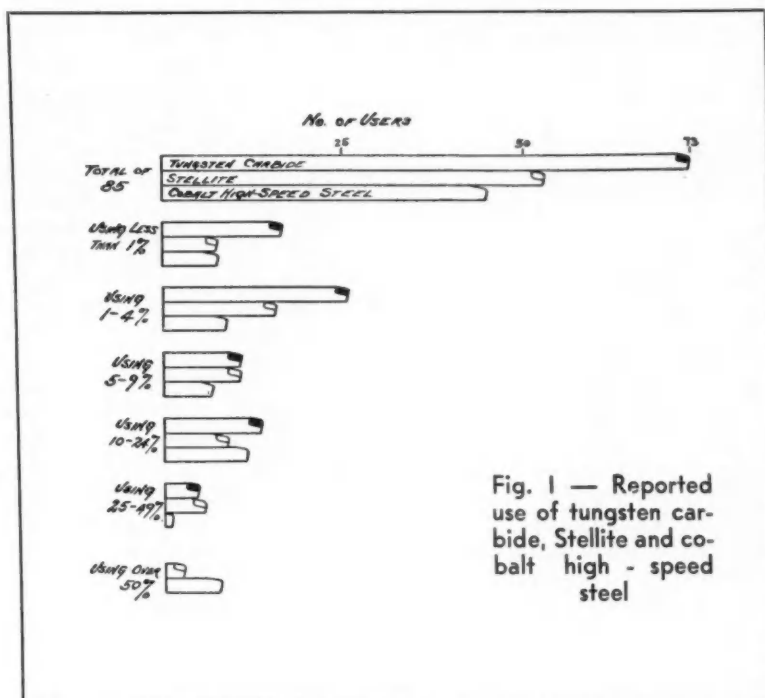


Fig. 1 — Reported use of tungsten carbide, Stellite and cobalt high-speed steel

cess of Tungsten-Carbide Tools," published in *Automotive Industries*, October 17, 1931.

An analysis of the relative use of the various cutting tool materials is found in Fig. 1, which is made up from returns by 85 plants.

Table 1 shows typical examples of savings on automatic screw machines.

Further experimental work is under way in many organizations. For example, General Electric has purchased specially designed lathes and large boring mills for work with tantalum and tungsten-carbide. Union Carbon and Carbide is conducting a series of experiments correlating red hardness and cutting

Table 1

Typical Examples Showing Savings on Automatics

Application No.	9	10	11
Material cut.	Cast iron	Steel	Malleable iron
Specifications	GMC 13M, 165-217 Brinell, normalized and cooled slowly	S.A.E. 1020	C 2.5, Si 1.05, Mn 0.43, 114 Brinell
Cutting quality	Hard scale	Hard scale	Good
Condition of machine tool	Good	Good	Good
Size of tool, in.	5/8 x 3/4	2 x 2 x 2 1/2	1/2 x 1/2 x 3
Size of tip, in.	1/4 x 3/16 x 3/4	3/4 x 3/4 x 1	
Shape of nose	Round	Forming tool	Diamond point
Clearance angle, deg.	5	12	6
Top side rake, deg.	6	0	3
Top front rake, deg.	6	0	6
Operation	Turning	Forming	Turning
Tool material	T-C Stellite	T-C H.S.S.	T-C Stellite
Cutting speed, f.p.m.	166 80	211 105	220 150
Feed, in. per revolution	0.002 0.002
Depth of cut, in.	3/16 1/8	0.03 0.03
Number of pieces per grind	1100 up 200	27,000 7,200	1800 800
Cost of tool	\$12.85 \$3.75	\$15.00 \$1.15
Time per piece, min.	0.534 0.876	0.50 0.66
Savings in labor cost, per 100 pieces..	\$0.34		\$0.17

quality, while Prof. O. W. Boston is working with cobalt high-speed steel. Production men will look forward with interest to the developments of this extensive program.

Preble on Conveyors

Continuous processes in automotive production plants demand longer and longer conveyor lines linking many separated buildings. How this is accomplished economically on overhead conveyors by means of "floating power" is described by N. H. Preble of Jervis B. Webb in a paper, "Application and Design of the Floating Drive for Conveyors." Essentially, the idea is to locate a number of separate driving units at strategic points along the conveyor. This reduces the total weight of movable conveyor mechanism, cuts down chain pull in each section and cuts down the total power required to drive the system. A sample calculation illustrating this is given in Table 2.

But this arrangement demands perfect synchronism in speed and power output of each unit. One successful solution is "floating power" embodied in the caterpillar drive shown in Fig. 2. It consists of a motor driving through a silent-chain or V-belt to a variable-speed transmission. This variable-speed transmission may be of the belt type, as manufactured by the Reeves Pulley Co. or the Llewellyn Manufacturing Co., or may be of the positive chain type, such as the P.I.V. unit manufactured by Link-Belt Company. Any of these three variable-speed transmissions operate by means of varying the position of the V-cones on which the belts or chain operate so as to change the ratio between the two shafts of the transmission, the change being effected by a screw mechanism operating on a pair of levers which push the V-cones closer together or pull

them further apart as required. The range from the minimum ratio to the maximum between the two shafts is in an infinite number of steps. The variable-speed shaft of this transmission is connected through a chain or direct through a flexible coupling to some form of reduction gearing, and from the reduction gearing either direct or through separate gears to the driving head shaft. The entire mechanism is rigidly mounted on the same form of frame, the driving sprocket operating a caterpillar chain and the same frame carrying a take-up sprocket around which the caterpillar chain passes. The floating drive mechanism utilizes this unit frame and machinery units, exactly as indicated in the diagram of Fig. 2, mounted in a separate and fixed frame. The frame of the caterpillar drive proper is carried on rollers and guided within the secondary frame by means of vertical rollers. As the caterpillar chain operates in a direction parallel to the driven conveyor chain, the reaction of the drive effort on the conveyor chain will move the frame parallel to the conveyor, this movement being counteracted by a pair of coil springs attached to the fixed frame and bearing against the floating frame. The strength of these springs is adjusted properly to counterbalance the calculated chain tension at the individual drive.

It is at once apparent that if the chain tension or driving effort goes above the calculated figure, the coil springs will be compressed beyond their normal position, and conversely if the reaction is less than normal or calculated figure, the floating portion of the drive will be moved in the opposite direction by the springs. This tendency to movement is the operating medium of the speed control. The adjusting shaft of the variable-speed transmission is connected to the fixed frame through a series of gears and levers, so that if the drive moves back under excessive load, it will be automatically slowed down, or if it moves forward under less than normal load, it will be automatically

speeded up. The result is that each drive will at all times adjust its speed to a certain chain pull, which will be determined by the strength and adjustment of the coil reaction springs.

This type of drive has been installed in a number of automotive plants and is claimed to give excellent results. The mechanism is simple and is easy to maintain in condition. The system of drives is protected by limit switches which shut off the current in the entire line if any unit is overloaded or goes out of commission.

Table 2
Single-Chain Conveyor with Drive Applied at More Than One Point

Total length of conveyor, ft.	4,600		
Trolley spacing, ft.	2		
Weight of load per trolley, lb.	80		
Weight of books, lb.	5		
Per cent of line fully loaded	80		
Minimum radius of horizontal turns, in.	24		
Minimum radius of vertical bends, ft.	10		
Speed in feet per minute, variable	10 to 50		
Moving load	Single drive	Four drives	
Chain, 4,600 ft. at 10 lb.	46,000	at 3 1/2 lb.	16,100
Trolleys, 2,300 ft. at 12 lb.	27,600	at 7 lb.	16,100
Hooks, 2,300 ft. at 5 lb.	11,500	at 5 lb.	11,500
Live load, 2,300 x 0.80 at 80 lb.	147,200	at 80 lb.	147,200
Total, lb.	232,300		190,900
Coefficient of friction, per cent	5		4
Chain pull at each drive, lb.	11,615		1,909
Power at drive sprocket		(1,909 x 50/33,000)	
(11,615 x 50/33,000) hp.	17.5	hp.	2.9
Diameter of drive sprocket, in.	30		20
Torque on head shaft, in.-lb.	174,125		19,090
Head-shaft diameter, in.	6 1/2		3

Casting Cooperation

Much interest was aroused by Alex Taub's discussion of cooperation between foundrymen and

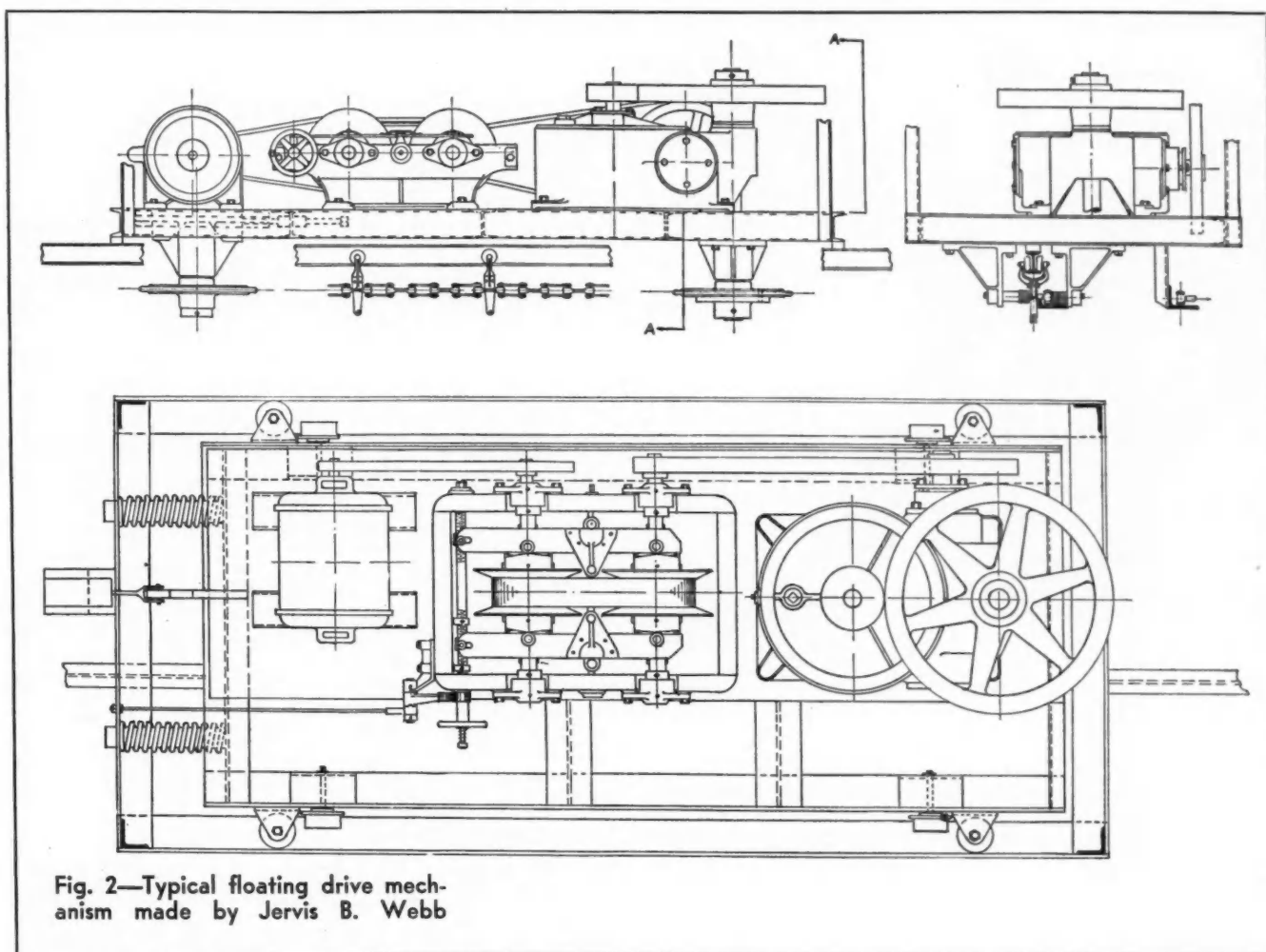


Fig. 2—Typical floating drive mechanism made by Jervis B. Webb

engineers in his paper, "Correlation of Casting Design and Foundry Practice." Although this paper is more or less general in nature, it stresses the elements of cost and design which may be controlled by proper design-foundry correlation. For example, Mr. Taub mentions the tendency to cut weight by reducing wall thickness in a cylinder casting. This is fatal unless the wall is too thick to begin with.

Another weakness is the design requiring overhanging dry-sand cores. Two forms, an hour-glass with a narrow neck and a piece with an overhanging projection, are given as examples of bad design resulting in core spoilage. It is pointed out that the true meaning of bulk is not the size and weight of a casting as is sometimes assumed, but is really a measure of the overall size of the flask. The general dimensions of a casting should be such as to use the volume of green-sand most economically. These and other controllable factors have a profound influence on the cost per pound of finished castings.

The consensus of those present was that more stress must be laid on the relationship between the designer and foundryman. One large manufacturer mentioned his practice of detailing a foundry expert for consulting service in the engineering department.

Field on Depreciation

Of timely interest was a paper, entitled "Dividend Programs Related to Depreciation," by E. G. Field.

Automotive Industries

His work particularly in the textile industry reveals that funds intended for depreciation reserves are usually diverted to other purposes such as: (1) to reduce current liabilities; (2) to buy in the company's bonds; (3) to provide property additions, and (4) to pay cash dividends. In the textile field this has led to the decline of the industry in New England due to the handicaps of worn-out equipment.

Following a study of five types of dividend programs the author concludes that a dividend policy is fundamentally wrong when it later may require the reduction or omission of future dividends to raise the funds necessary for equipment replacements. This is on the premise that the depreciation reserve has been diverted to one or more of the channels mentioned above. Instead of cash dividends, the author recommends stock dividends as a means of acknowledging the extension of facilities while conserving the depreciation fund.

By a historical study and interpretation of financial statements the author shows the possibility of judging the real worth of any company. Two ratios are of prime importance: $\frac{\text{current asset}}{\text{current liability}}$ and $\frac{\text{current investment}}{\text{current liability}}$.

Both ratios are affected by the condition of the depreciation fund. The second particularly may indicate to the banker or investor the soundness of financial policies and the ability to keep up with technological advances through regular replacements. Over a period of years, each ratio should be approximately constant, and both should bear a rational relation to each other.

(Turn to page 919, please)

December 12, 1931



CA. VANE, general manager, National Automobile Dealers Association, has set down in black and white suggested revisions for contracts between factory and distributor; distributor and dealer, and dealer and sub-dealer which, in his opinion, are needed to end the 25-year controversy that has been going on between manufacturers and car dealers.

The first of these—the suggested manufacturer-distributor contract—was published in detail in the N.A.D.A. Bulletin of Nov. 5. It differs from the average factory-distributor contract in many respects, important among which are:

Vane Contract

1. Runs for period of five years, unless cancelled.
2. Provides exclusive territory for distributor.
3. Provides mutually agreed quota, but adds percentage of total quota distributor will maintain in stock each month.
4. Factory agrees to reimburse dealer when prices are cut, giving him difference between price he paid and reduction on cars in dealer's stock at time of reduction.
5. Distributor may elect to treat any reduction of discount as a cancellation of agreement by manufacturer.
6. Distributor agrees to deposit a stated sum with manufacturer to insure fulfillment of agreement.
7. Cancellation on six months' notice by either manufacturer or distributor. (Three months' notice in case of smaller dealers.)
8. In case of cancellation by manufacturer, manufacturer agrees to assume lease obligations of distributor or, if distributor owns his place of business, to pay him a fair rental to end of contract period. (This applies only to such leases as manufacturer has approved in writing of the distributor's having signed.)

Dealers say—

We want security.

We have worked hard and have sacrificed much to build up our business, and we want to feel secure in our business relationships with our factory.

We cannot afford to risk our business future through one-sided contracts.

Fair Play Sharply In Model Contract

Usual Contract

Runs for one year unless cancelled.

Sometimes provides exclusive, sometimes open territory.

Provides quota, but often binds distributor to accept shipment "of, as, and when" tendered by manufacturer.

This same provision is common but not universal already.

No specific reference.

No such deposit required.

Cancellation on 10 to 15 days' notice by either manufacturer or distributor.

No such provision.

Manufacturers say—

We must have control.

We have staked millions of dollars upon the business of building and merchandising cars and trucks.

Unless we keep control, all may be lost—not only to us but to our faithful, hard-working dealers as well.

Our control is their security.



Set by C. A. Vane For Sales Outlets

by Norman G. Shidle

Vane Contract

9. In case of cancellation by manufacturer, manufacturer agrees to assume distributor's obligations or liabilities on all time-payment contracts covering new car sales.
10. In case of cancellation by manufacturer, manufacturer agrees to repurchase distributor's parts stock, the price to be paid for the part to vary in accordance the length of time the given part has been in distributor's possession. No parts more than three years old will be repurchased.
11. In case of cancellation by manufacturer, manufacturer agrees to repurchase new cars in stock.

The Vane distributor contract does not include any clauses relating to parts shipments, parts discounts, etc., common to the average contract, probably because Mr. Vane has concentrated his suggestions on those phases of the contract which he sees as of major importance to the dealer. Certainly definite terms regarding parts matters are extremely important and might well form the basis of quite specific study along just the lines followed by Mr. Vane in his current analysis.

Obviously the suggestions of major importance in the Vane contract are those relating to:

Usual Contract

No such provision.

This general provision for repurchase of parts is already in most contracts, but the varying price in relation to age of part is not.

This general provision is already in most contracts, but is sometimes optional with manufacturer.

1. Contract to cover period of five years;
2. Cancellable without cause by either party on three months' notice in case of smaller dealer and on six months' notice in case of distributor;
3. Factory agreement to assume liability on outstanding finance paper at time of cancellation;
4. Factory agreement to take over lease obligations in case of cancellation;
5. Closed territory.

In his suggested contract for sub-dealers or associate dealers, we understand, Mr. Vane will suggest that the country be divided into 125 major sales zones. Where a zone is a multiple dealer point, no new dealers, sub-dealers or distributors should be named for a period of five years, except that a new dealer may be appointed to replace any whose contract is terminated. At the end of two years, the factories should cancel dealers at multiple dealer points who for 18 of the 24 months preceding shall have operated at a loss. When so cancelled no new dealer should be named except upon the consent of all the remaining dealers.

With the publication of these suggested contracts, Mr. Vane has once again stuck a sharp prod into a vital situation; a prod which, while it will be resented by some and scoffed at by others, cannot fail to have a fundamentally good effect on the thinking and action of the industry.

No Unfair or Dangerous Obligations

Careful study of the provisions of the Vane distributor contract, for example, indicates that it places no unfair or dangerous obligations on the manufacturer who is prepared effectively to carry out in practice those intentions of fairness which permeate the fundamental thinking in most cases.

Some factory men argue, and with reason, that the intent is so much more important than the terms of a contract between manufacturers and dealers or distributors that the detailed terms of the contract matter relatively little one way or the other. Despite a strong element of truth in this point of view, Mr. Vane makes a poignant thrust at its vulnerable point when he says in a recent letter to Don Blanchard, editor of *Automobile Trade Journal*, that:

"The weakness of the argument that it doesn't make any difference what the contract says, because it is the intention of the parties that will prevail, is to be found in the fact that under the present form of contract, no one—either dealer or banker—knows what the factory's intention toward the dealer is, and no one knows when the factory will change its intention if that intention be good. . . .

"If factories mean to be fair to dealers, then why not place in the contract the intention? . . . The trouble with the present arrangement is that the manufacturer insists on binding the dealer intention, but will not himself be bound."

Take the agreement of the manufacturer to assume lease obligations of the dealer in case the manufacturer cancels and has previously in writing approved the signing of the lease. Whatever the intention of the manufacturer under present contract conditions, it is almost certain that he will give more thoughtful consideration to the money-making possibilities inherent in a new building lease or building purchase by a dealer if the Vane suggestions are incorporated in his contract. Neither the Vane contract, nor any other probably ever to be devised, can insure the dealer of fair treatment if the intent of the factory is to be unfair. But several of the new provisions suggested by Mr. Vane do seem to make fairness by the factory much more to its advantage, and unfairness much more to its disadvantage than under current contracts.

The lease obligation in itself affects directly or indirectly nearly every phase of dealer-manufacturer relationship and nearly every phase of the dealer profit problem. With the prospect of lease obligation before him, for example, the manufacturer will hesitate to

give a franchise to an inadequately capitalized retailer, lest the latter fail to make good and necessitate early cancellation. Forcing of cars on dealers would be less profitable to the manufacturer, if he had to assume lease obligations for dealers made unsuccessful and cancelled as a result. Main street locations with overheads too heavy for the available sales volume would rarely be urged by manufacturers faced with assuming the lease obligations should the experiment prove unsuccessful.

Then, too, effectiveness of operation as well as mere "fairness" is definitely involved. Few factory policies are half as hard-boiled or half as inconsiderate as the interpretation put upon those policies and the methods used in carrying them out might indicate. There are frequently wide differences, as every factory man knows, between the establishment of a policy at headquarters and its effective utilization in daily routine. The new provisions of the Vane contract, it seems, would tend toward placing a premium upon effective operation; advance study of dealer needs from dealer viewpoints—greater use of reason in place of the cancellation threat to get dealer acceptance of factory ideas, and so forth.

While it is too early to make any generalized statements about the practical effect of the Vane proposals on future factory-dealer contracts, it appears at the present writing as though some of the new provisions were sure to be incorporated in some factory contracts within the next few months; that they will be disregarded temporarily by most factories, but that gradually they may be found to be creeping in more and more as time goes on.

Multiple-Point Ignition

RECENT tests in connection with multiple-point ignition and best location of the spark plug, conducted at the plant of the H. H. Franklin Mfg. Co. in Syracuse, N. Y., are said to have shown that ignition of the charge in an engine cylinder by means of simultaneous sparks at a number of equally spaced spark plugs does not increase the horsepower obtainable from the engine over that with a single spark plug, provided that in each case the spark is set for maximum advance without injurious detonation. If a single spark is set to fire at the small advance which is best for multiple-spark ignition, then there is a certain gain in power with multiple-spark ignition, whereas if the same advance is used with multiple-spark ignition which is best for single-spark ignition, then the engine with multiple-spark ignition will detonate badly and show a loss of power.

AT the recent Shipping, Engineering and Machinery Exhibition at Olympia, London, the British firm of Davey, Paxman & Co., Ltd., of London, exhibited a six-cylinder, heavy-duty, 300-hp. Diesel engine with a frame made entirely of steel stampings that were united by welding. The construction is claimed to give a very rigid structure of very moderate weight. A valuable feature of the design is that the stresses due to the pressure of combustion are taken direct from the cylinder heads to the main bearings by continuous steel plates, of which there is one between each pair of adjacent cylinders. These plates are so arranged that they form a sling around the cylinder-head plates and crankshaft bearings. No horizontal joints are used.

PRODUCTION LINES



By Industry or Legislation

Many smart thinkers have warned that industry must tackle labor problems before they become political footballs. Were they prophetic? Recently (Oct. 26, 1931) Industrial Commissioner Frances Perkins of New York State reported to Governor Roosevelt on a plan for unemployment insurance. The report suggests a 7-state insurance authority with provisions patterned after the British system. Briefly, the plan would cover great emergencies only. And not in the hope of solving seasonal fluctuations. Benefits would be based on the premiums collected. Employers should bear the entire cost, the report recommends.

In the Balance

Wet grinding brings in some fine questions of grinding wheel balance, which have been disposed of in scholarly fashion in a recent issue of *Grits and Grinds*. Conclusions based on experiments indicate that "if a wheel is balanced while wet and then operated in a machine it will soon be out of balance, because, upon rotating, part of the water in the wheel will be thrown out. And the balancing weight itself will then cause an out-of-balance condition."

These tests suggest another thought. "If wet wheels become out of balance by standing in one position, would it not be a good idea to expel as much water as possible from all wheels used for wet grinding, at the end of each day's

work? This could easily be done by running the wheel for a minute or two after shutting off the water."

Needling

What happens if after a road test body squeaks develop around the roof and other inaccessible places? Usually it means troubleshooting. And often the headlining has to come off. Here is an easier way. Why not squirt a "dry" lubricant right to the sore spot by means of a hypodermic needle? Several such lubricants are available. One, by Shaler, called "Riz," is a colorless wax carried by a volatile vehicle. The solvent vehicle evaporates, leaving the wax. Looks like a mighty good stunt not only for the car factory but the dealer and service station.

Now It's Gamma

Much interest has been aroused in the possibilities of using the gamma rays of radium in inspecting castings and structures for internal defects. The technique is new. And it is therefore quite timely to find a discussion of its possibilities in *Research Narratives*, Oct. 15, 1931. Gamma rays will penetrate 12 in. of steel. Tiny flaws only 2 per cent of the thickness of the object have been detected. The practical advantage of the method is that a tiny capsule of radium is sufficient and may be readily transported anywhere.

Flexible Power

An ingenious system of flexible convenience outlets for industrial plants has been perfected by the Trumbull Electric Mfg. Co. Its elements very briefly are:

1. Buss-Wa, not equipped with branch outlets but servicing the entire load from switchboard and transformer bank.

2. Flex-A-Power, providing branch runs with power outlets, fed from Buss-Wa.

3. Flex-Adapter adds flexibility to any section of Flex-A-Power by increasing the number of outlets per unit of space.

4. Flex-A-Power, Jr., takes care of smaller amperage requirements needed in any run branching from Flex-A-Power and providing suitable power outlets.

For high-frequency tools you have Trolley Closure consisting of a steel housing containing bare copper wire strung as an overhead trolley.

Burned Out

Just as automobiles three or four years old are obsolete and deteriorating mechanically, much manufacturing equipment in some plants is now out of date and burned out. Evidence of this is found on every side. Appropriations for new machinery have been strangled in recent months, necessitating a lot of patching of a temporary nature. We learned of a case recently where one large manufacturer returned a battery of about 15 machines to the builder for overhauling (incidentally for the first time in their experience). These machines will be in good shape. But how hopelessly outmoded. When production resumes they must be replaced for economy. Remember this when you study your own problem.

Keen and Close

No doubt you are interested in what the other fellow is doing in jig boring. A new handbook showing some important applications has just come out. It shows set-ups, tolerances, and performance records on Swiss Jig Borers. The R. Y. Ferner Co., American agents for these machines, will be glad to send you a copy.—J.G.



Houdaille Shock-Absorber Covers Wide Speed Range

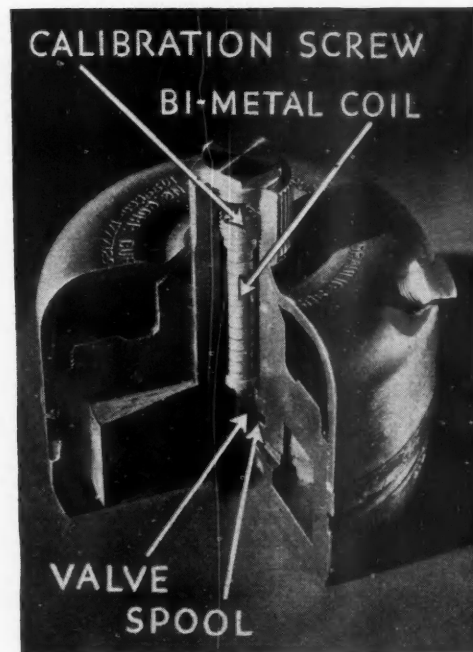
Unit used on new Studebaker lines designed for rapid pressure build-up, to resist the unexpected bumps of high-speed driving, even with normal "boulevard" adjustment

IN both the Studebaker President and Commander lines, announced in *Automotive Industries* (last week), the shock absorbers are Houdaille hydraulics with a double vane displacement unit to provide a balanced condition, i.e., the torque reaction produced is in the form of a couple about the vane shaft. The fluid passes alternately through an orifice controlled by the valve from the rebound chamber to the bump chambers. Check valves communicating with the reserve fluid chamber maintain the other chambers full of liquid.

The thermostat assembly consists of a calibration screw, the bimetallic coil, the male portion of the valve and a strut. The calibration screw is slotted and spread so that it will not change its position after calibration. One end of the bimetallic (thermostatic) coil is fixed to this screw and the other to the male portion of the valve, which is a ground pin with a flat milled on one side. Inside the coil there is a strut, ball jointedly connected on one end to the valve and in like manner to the calibration screw on the other end. This permits the assembly to be self-aligning, while leaving the valve free to turn with respect to the calibration screw.

The female portion of the valve is a bushing pressed in the inside end of the vane shaft. It has a transverse groove cut on the outside providing a communicating orifice for the two rebound chamber ports. The effective length of this orifice at any time is controlled by the position of the male portion of the valve, controlled in turn by the bimetallic coil. As the temperature drops, the valve turns with relation to this bushing, uncovering more of the slot and increasing the effective orifice to compensate for increased oil viscosity, and vice versa.

The form of the orifice and the mechanical design of the valve govern the shock absorber reaction in relation to the severity of bump encountered. The fluid restriction is a sharp edge orifice insuring turbulent discharge, to give the maximum rise in hydraulic pressure as the velocity of discharge is in-



Cutaway view of the new Houdaille shock absorber

creased. In addition to this, the velocity impact of the discharge on the side of the valve opposite to the orifice tends to turn the valve against the spring action of the bimetallic coil, decreasing the effective orifice and increasing the shock absorber reaction.

The design is intended to give a rapid "build-up" in pressure characteristic for unexpected bumps at high-speed driving, while enabling a spring design and normal shock absorber setting of a character to give a soft "boulevard" ride.

WHAT is said to be the first institution of its kind in the world, the College of Aeronautical Engineering, was opened in England recently. Its object is to train young men for the ground staffs and administrative posts in aviation. The class rooms and work shops are located at Chelsea, while the aerodrome and planes are at Brooklands.

Indian Hits Warpath With 3 Revised Lines

Lower frames and streamlining on 1932
Motorcycle models give comfort to rider
through cooler operation and better springing

THREE new models of motorcycles designed to meet sport, police and utility requirements are announced for 1932 by the Indian Motorcycle Co. These new models embody changes making for better appearance, improved riding, engine performance and durability.

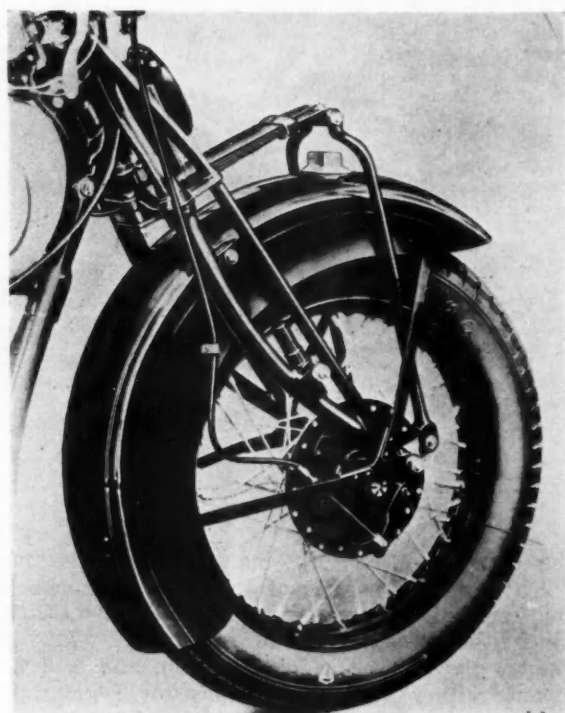
More than fifty new features distinguish the new Indians from preceding models.

The new finish is duPont DuLux and is offered in 12 color combinations, optional at no extra charge.

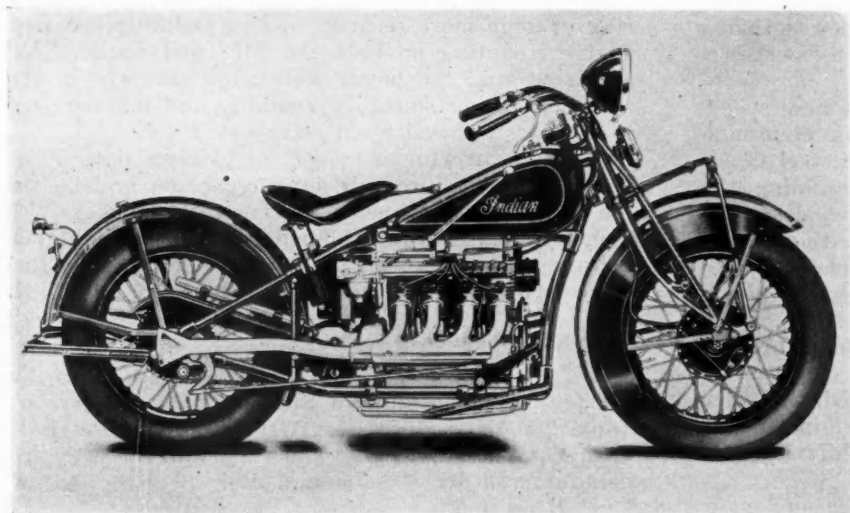
While the Indian Scout "74" and "Four" models for 1931 are distinctly new in design, they still retain basic points of engineering from past practice. A battery ignition unit will be standard on both these models with magneto obtainable at a slight extra cost, if desired.

The new battery ignition unit operates entirely independent of the lighting system, with the regular Auto-Lite generator retained as standard equipment. A new and larger Willard storage battery will be fitted to all models, in a new style bracket which holds the battery where it will run cooler.

The Indian "Four" for 1932 retains the same general power plant layout with changes in the design of



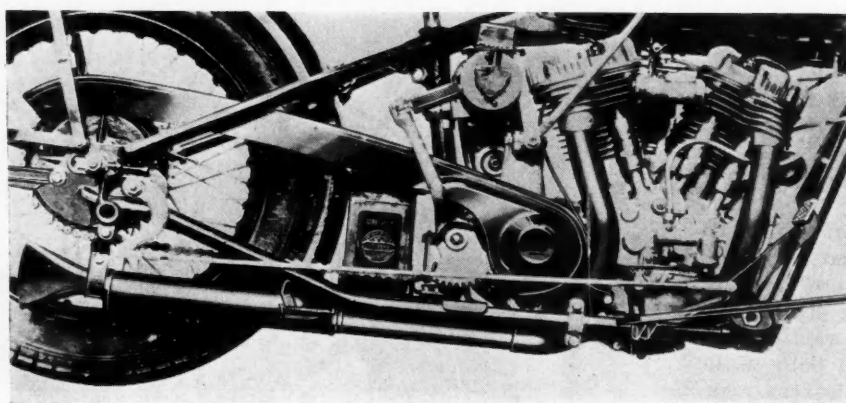
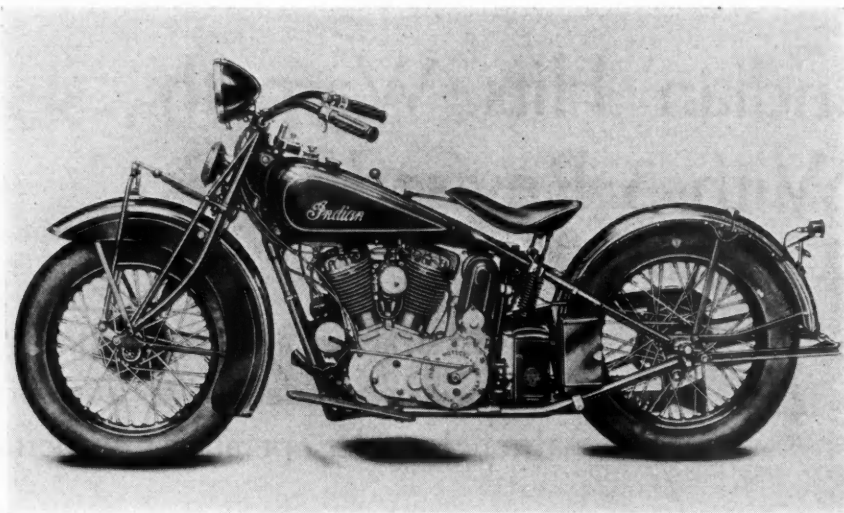
The front end of the Indian affords better protection and has sturdier forks as shown above



The Indian 1932 line has been redesigned with a streamline effect as shown in this Model "4"

The new two-cylinder Indian Model 74 for 1932 presents a new appearance

Below is shown the improved frame with streamlined exhaust



the cylinder heads, the manifold, and the muffler.

First and most basic of the 1932 improvements is the new, more rugged frame. This new frame will take either the Scout "45" or Indian "74" powerplants, gives lower saddle position, and will accommodate either a spring seatpost or regulation coil saddle spring bracket. A solid head-forging carries a socket for a theft-proof lock.

New twin steel streamlined gasoline and oil tanks are standard on all the new Indian models. Fuel capacity is greater. Filler caps are of new stainless steel, and a reserve shut-off cock makes an emergency supply of gasoline available.

In connection with the new tanks, the new speedometer mounting is simple in design, an aluminum bracket extending down between the twin steel tanks, clamping around the top frame tube, holding the speedometer on its top. The new frame, described above, makes possible a new low saddle position.

The saddle suspension has been completely redesigned. A new, wider saddle front connection pivots as near the center of the machine as possible, while the saddle is suspended on a new coil spring bracket which gives four distinct positions for adjustment, according to the rider's weight. If desired, the rider may have a spring seatpost as optional equipment, at no extra charge. A new longer gear-shift lever is fitted, with hard rubber ball on the top.

New clutch and brake pedals are wider on longer

pedal arms. A new position of the hand-brake lever, closer to the grip, simplifies front brake operation with the hand.

Indian Scout "45" and Indian "74" models are fitted with a new design muffler which affords more road clearance, at the same time giving silent operation. A through valve is fitted to this muffler and, even when open, operation is quite silent, due to the silencing effect of a large fish-tail fitted to the end of the muffler. The Indian "Four"

is likewise equipped with a new muffler of larger capacity, and the new tail pipe and fishtail are well up out of the way, affording ample road clearance.

Chief among the refinements in the 1932 Indian engine are the new heavier cylinders on the Indian "74" model, affording cooler running and more efficiency. On the same machine, the new design cylinder heads afford a better spark plug location and will also aid cooler running.

In the Indian "74" there is a new piston pin retaining ring offering more security and accessibility. A new engine mounting on both the "45" and Indian "74" serves to hold the power unit more securely in the frame, inducing smoother running, and making possible easier removal when necessary.

On the four-cylinder model, the cylinder design has been changed, affording a bigger exhaust outlet. On the "45" and "74" models, second speed gears are higher, aiding getaway and helping to maintain higher average speed with load in uneven country. New improved spark plugs on the Indian "Four" are air-cooled.

Bantam Ball Bearings

WE are informed that all of the rollers used in the free wheeling units of Studebaker, Pierce-Arrow, Hupmobile, Hudson, Essex, Graham-Paige, Peerless, Marmon, Willys-Overland, Nash and Rockne cars are manufactured by the Bantam Ball Bearing Co. of South Bend, Ind.

Litigation Tangles New York Truck Market

(Continued from page 901)

makers do their business through dealers, and intimates that the purchaser of assembled trucks does not have a responsible business organization of stable character through which to service his trucks. In respect to this assertion, little needs to be said, except to call attention to the fact that there are, throughout the country, large numbers of dealers in trucks and motorcars, whose financial responsibility as individuals, in many instances, approaches that of the manufacturer of the vehicle itself."

Mr. Peirce of Diamond T referred to statements of Mr. Scaife that during the war he was a member of Class A Design Committee for trucks, and of Mr. Masury that he is chairman of the Ordnance Advisory Committee of the U. S. Army and a member of the U. S. Army Quartermaster's Advisory Committee on Motor Vehicles.

"The U. S. War Department, represented by the Quartermaster General," Mr. Peirce continued, "has decided to adopt as standard for trucks for the transportation of men and munitions during peace and war trucks of the assembled type. . . ."

Mr. Peirce of Diamond T stated that "Mack Trucks, Inc., and the White Motor Co. have been changing their policies with respect to the manufacturing of all of the parts which are used in their trucks in the past few years, and are today buying some parts from parts manufacturers which they formerly manufactured themselves. This affiant is informed that Mack Trucks, Inc., and White Motor Co. today purchase from parts manufacturers and in many instances from the same manufacturers as the Diamond T purchases its parts." Mr. Peirce cited axles, wheels, and universal joints, as examples.

"The Diamond T Motor Car Co.," Mr. Peirce continued, "has been in business for 26 years, and has been under the same management continuously.

"Affiant further states that the cost of overhauling an assembled truck is much less than that of a so-called manufactured truck."

Mr. Alden of Timken-Detroit expressed his belief that the qualifications of companies seeking to supply the city of New York with equipment might well be considered under the following four headings: Financial and material resources; experience gained over a period of years; facilities for production of high quality material, and service.

Mr. Alden's Comments

Following are extracts from Mr. Alden's comments under each of these headings:

1. "As the producer of so-called assembled trucks has at his command the entire unit manufacturing resources of the country, these real financial resources are far in excess of those of any individual producer of manufactured trucks. The capital and surplus of the Timken-Detroit Axle Co. alone is \$16,288,833.67.

2. "The unit manufacturer does not, never has, and never can produce a line of 'canned' units which are just sold off the shelf. In general the unit manufacturer has had more varied experience on which to design and build units than has any one individual truck manufacturer.

3. "As the unit manufacturer has had to concentrate on one line only, and as competition among unit manufacturers has forced quality up and prices down, he has had to fortify himself with the best of production equipment.

4. "The Timken-Detroit Axle Co. has, for over 20 years, sold continuously to some producers of assembled trucks."

Mr. Alden expressed his conviction that there was no more danger of pirating of parts with one than with the other classification of trucks, and that "of course it is wholly within the control of the ultimate user."

"Many producers of so-called assembled trucks," he continued, "have been in existence just as long as some of the producers of manufactured trucks. The latter have no monopoly of brains or experience."

Mr. Angell's Facts

Mr. Angell, president of Continental Motors, confined his affidavit to a fact-by-fact statement giving details of the history, financial condition, service facilities, etc., of the company.

He pointed out that his company has conducted its business since 1902; has successfully designed, manufactured and sold upward of 2,250,000 internal combustion engines; maintains and operates two large plants at Detroit and Muskegon, Mich., and furnishes quick service at 38 parts stations located in various parts of the United States.

Mr. Balough, president of Hercules Motor Corp., declared that "the experience of large fleet operators, many of whom have operated large fleets of both classifications of trucks, are a matter of record, and a close analysis will undoubtedly prove that the specialized truck built by the so-called truck assembler has given equally as good satisfaction as the so-called manufactured truck."

Most if not all of the "manufacturers" of trucks, he said, buy their "carburetors, ignition apparatus, universal joints, springs, frames—or at least their component parts—wheels, and many other units and parts without interference to the idea of proper coordination."

Mr. Stewart declared that "from his many years experience as a motor truck engineer, designer, and manufacturer, he considers many of the statements of said Masury biased, misleading, and at variance with his knowledge and experience."

He pointed out that "even Mr. Masury's company purchases its frame rails or frames from the Parish Mfg. Co., universal joints from the Spicer Mfg. Co., roller bearings from the Timken Roller Bearing Co.," etc.

Mr. Stewart disputed Mr. Masury's statement that "assemblers" were transient in life, pointing out that some of them were organized 15 to 25 years ago. Mr. Stewart also outlined in different language a number of the arguments of other affiants.

Mr. Mohun of Willys-Overland held that the practice of buying parts from "outside component parts manufacturers of reputable standing" made for "better material and quality at lower prices."

Step by Step Business is Approaching a New Perspective

By Arthur W. Berresford

Secretary, National Electrical Manufacturers Assoc.

THE current economic depression cannot be ascribed to any single cause, nor will a panacea be found in righting any single wrong. Moreover, there is little of value at the moment in attempting to isolate and correct the major causes. They will gradually emerge from the present chaos as time provides a perspective, their evaluation will furnish the basis for long-time planning which should operate against recurrence.

But this long-time planning, valuable as it would be, cannot be done now. The problem is too vast, the factors too many, and their interrelations too complicated to be grasped and ordered by the human mind. So, in place of the coordinated effort, working to a clearly pictured common end, and along clearly mapped lines, which would be the outcome of a master plan, but which we cannot have, we must use what we have.

What have we? We have millions of men and women, each one of whom comprehends clearly some small part of the whole. If each of them spends a day in doing his individual best toward moving those things that he understands in the direction he knows to be right, there is no fear of the outcome. There may be a wastage which would be absent in the master plan, but the whole will move forward and will move forward surely and before a master plan, however imperfect, could be evolved.

This is old and simple doctrine. Anyone can think it, and unfortunately it carries none of the exaltation that comes from the spectacular. But it is sound doctrine, and in the measure in which it is *practised* will be found the rate at which we will progress.

Human progress is not the result of the effort of the outstanding few, be they statesmen, industrialists, scientists, engineers, or inventors. It is the cumulative effect of the daily effort of the millions. The leaders but guide or accelerate it. The summation of the thousands of millions of small things is greater than the greatest large thing that the human mind can grasp. The combined effort of millions of average human beings will outweigh the most daring conception of the greatest vision the world has even known.

These millions will put forth that effort, not as a result of ordered consideration, nor even by reason of instinctive realization, and least of all from any altruistic motive, but purely and wholly from self-interest. The efficiency of the process will lie in the degree in which that self-interest is intelligent—the hope of efficiency in the fact that there is growing comprehension that self-interest must be intelligent.



The average manufacturer perceives today that his interest and that of his workmen is a common one. He does not prosper if they do not. This has long been the conviction of the few, but it required the current condition to bring home this realization to the many. Again will be demonstrated the workings of this simple doctrine of mass effect. Eighteen months have increased the *quantity* of understanding more than the preceding 18 years.

Further, there has been made manifest the need for balance in the economic forces of our involved civilization. A force is constructive or destructive in the degree that it is or is not controlled. Production, whether of foodstuffs, of raw materials, or of finished goods, is constructive if balanced against consumption. It is destructive if unbalanced and guided only by unintelligent and immediate self-interest.

The means are not yet clear. A period of trial and error is to be expected before an approximate solution is found; but the mere fact that stabilization of employment is economically dependent on controlled production, and consumption dependent on stabilized employment, will unite all elements in a common demand for that solution.

It would not have been possible five years ago; but the thinking forced on the many in the past two years has brought an understanding of fundamentals which

makes it not merely possible, but certain very soon.

The present conditions are difficult to contemplate with mental serenity and undisturbed confidence, but they carry more of ultimate value than the prosperous years that preceded them. The growth of understanding by the many will form the foundation for a new and greater progress, for a civilization such as the world has not yet known. In this progress the engineer and the engineering method of basing procedure on determined fact will have a major part. The saying, that through adversity we progress, will again demonstrate its truth.

A. S. M. E. Meeting at New York

(Continued from page 909)

Another device designed to test the financial stability of a company is the relation between indicated net worth and book value. The difference between the two represents the amount of additional money that must be put back into the business in order to restore the full values.

In the opinion of many management engineers Mr. Field presented a powerful argument for the maintenance of a real depreciation fund. Certainly the effect of a sound financial policy on bankers and investors cannot be overestimated.

The completion of the first phase of a study designed to develop formulas and isolate the factors entering into the selection and replacement of manufacturing equipment was reported by F. E. Raymond. The preliminary report, entitled "Economic Life of Equipment," was written by H. O. Vorlander and F. E. Raymond. In this paper, definitions are given for the following major elements: (1) True accounting life; (2) true economic life; (3) critical or minimum life; (4) serviceable life, and (5) physical life. Fundamental formulas based on a theory of economic utilization of capital resources are completely developed. For our purpose these are omitted because their practical and workable form will depend upon a further study of specific types of equipment.

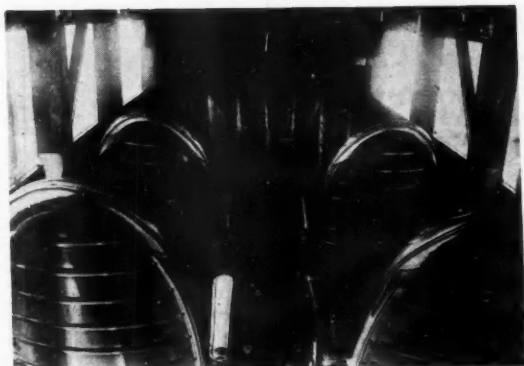
The satisfactory conclusion of this project and the development of simple formulas of direct benefit to industry now depend entirely upon the cooperation of interested production executives. If you can cooperate, communicate with the secretary of the Main Research Committee of the A.S.M.E. or with the writer. Here is a glorious opportunity to develop a workable tool for management.

To our mind the session on the coordination of research and engineering with production and sales served to emphasize the gap which exists between the engineer and the service field. As ably pointed out by John A. C. Warner in his recent talk and by Norman G. Shidle on numerous occasions, this gap must be bridged by getting the engineer out into the field. The research department will profit greatly if and when such liaison effort is established.

One of the Largest Single-Engined Airplanes



New single-engined airplane, "Pilgrim," carries nine passengers and 725 lb. of mail or baggage



Interior view of new "Pilgrim"

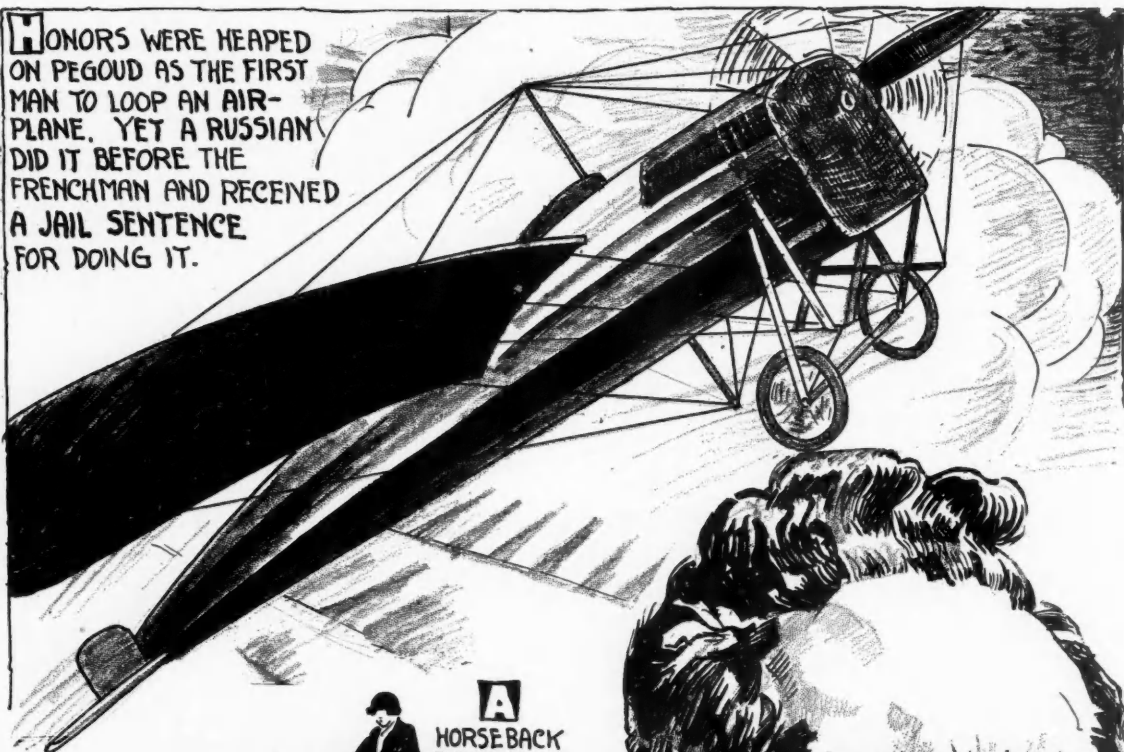
ONE of the largest single-engined airplanes ever built has been put into service between St. Louis and Chicago by American Airways, Inc.

The plane, called the "Pilgrim," was designed and built in a factory operated by American Airways at the St. Louis terminus. The ship, which is powered with a 575-hp. Hornet engine, carries nine passengers and 725 lb. of mail or baggage. The mail-baggage compartment is beneath the fuselage, a new feature. The cabin is insulated to reduce the engine noise and extra large air wheels are used on the landing gear. The pilot's cockpit contains complete night-flying equipment and two-way radio telephone.

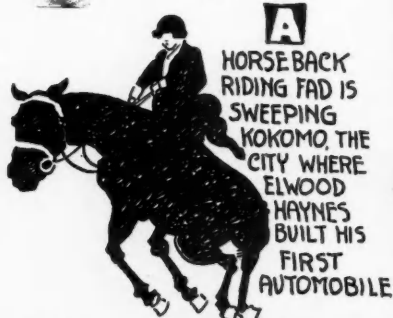
The new plane is named "Pilgrim" because it is believed it will take the lead as an economical unit in commercial flying, Col. Halsey Dunwoody, vice-president of American Airways, explained.

Automotive Oddities—By Pete Keenan

HONORS WERE HEAPED ON PEGAUD AS THE FIRST MAN TO LOOP AN AIR-PLANE. YET A RUSSIAN DID IT BEFORE THE FRENCHMAN AND RECEIVED A JAIL SENTENCE FOR DOING IT.



JACK FROST IS THE NAME OF A REFRIGERATOR TRUCK DRIVER IN PORTLAND, Me.



A HORSEBACK RIDING FAD IS SWEEPING KOKOMO, THE CITY WHERE ELWOOD HAYNES BUILT HIS FIRST AUTOMOBILE

NEW AUTO WHEEL



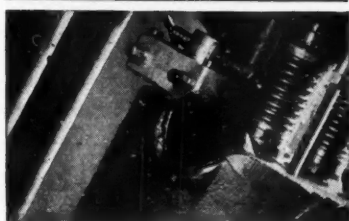
INVENTED BY THE ZIPPER BROTHERS OF AUSTRIA. IT HAS NO BOLTS OR SCREWS AND CAN BE DIS-MOUNTED OR ASSEMBLED WITHIN A MINUTE.



THE KAISER. DESIGNED THE EMBLEM FOR THE IMPERIAL AUTO CLUB
March 1906.

Do You Know
An "Oddity"?

Correspondence about "Automotive Oddities" is invited. Contributions used will receive editorial mention when practicable. If you are interested in the source of, or the reason for, a particular "Oddity," ask the editorial department of Automotive Industries about it.



NEWS

OF THE INDUSTRY



Equipment Groups Meet and Elect

Joint Trade Show and Conventions of M.E.A. and N.S.P.A. Draw Huge Trade Gathering to View the Exhibits

Over 10,000 See Show

ATLANTIC CITY, Dec. 10—The joint M.E.A. and N.S.P.A. show, which opened here Monday in Convention Hall, promises to be the most successful event in the history of the associations.

More than 300 exhibitors are showing their products in the 650 booths, and attendance is expected to total more than 15,000.

The M. E. A. came to its annual convention as a single association, but will depart as two separate organizations. These will be the Motor & Equipment Manufacturers' Association and the Motor & Equipment Wholesalers' Association.

Business sessions of the M. E. A. opened Dec. 5, and the convention of the N. S. P. A., attended by more than 500 delegates, opened Dec. 2.

This was the 12th M. E. A. show and the 8th held by the N. S. P. A. Both associations voted to hold a show in 1932.

Initial meetings of the new M. E. M. A. were held this week.

G. L. Brunner, Brunner Mfg. Co., was elected president. Other officers elected were David Beecroft, Bendix Aviation, vice-president; C. H. Burr, SKF Industries, treasurer, and C. C. Secrist, Victor Mfg. & Gasket Co., secretary.

Committee chairmen appointed were G. L. Brunner, executive; J. M. McComb, Crucible Steel Co.; N. H. Boynton, National Lamp Works, G. E.,

(Turn to page 923, please)

BY a long and sinuous grapevine comes the appended addition to the saga of the industry; an addition which will undoubtedly be told and retold many times in New York hotel rooms during the second week in January. Sorry we can't mention names, for if you've read this issue carefully, page by page (as indeed you should have, *Adv't*) you will have a good idea where to fling your chuckles.

The sanitary department of Megalopolis, by fruit of diligence and wisdom saved \$4,000,000 of the people's money which (in council of the learned) it was decided to spend on the purchase of vehicles of burden. So bids, or tenders, were called for, with the specification that bidders (or tenderers) should be of the class known as manufacturers, and with the further specification that bids should be based on the number of sanitary trucks that the bidder cared to make for the capital amount (all figures in this story are more or less fictitious, we hope).

Sat down the engineering and sales departments of truck manufacturer A and decided that Megalopolis could have exactly 972½ of their product for that amount. Far to the east sat down the engineering (and sales) departments of manufacturer B, and from the united minds assembled emerged the thought that they also could produce 972½ units for the designated sum. Neither company knew of the other's decision.

Both companies were faced (at different times, different places) with the thought that one-half (½) a truck, be it A or B, would not look well on the streets of Megalopolis. So company A decided to throw an extra half truck into the bid and make it read 973 units. Company B decided that contracts and bids being what they are that the half-truck wouldn't make any difference and made the bid read 972 units. Came the time to open the bids; company A got the award by the length of a truck.

Chevrolet Motor Co. used 5355 leading daily and weekly newspapers in the United States to introduce the new 1932 Chevrolet Six last week. In addition to newspapers, the program profited by the use of radio, poster panels, phonograph records, canvas banners, dealer window displays, and several other media. Hurrah!

Herbert Hosking

THE
NEWS
TRAILER

New Tax Proposal Draws Heavy Fire

Opposition to Suggestion for Excise Levy on Motor Vehicles, Bodies, and Accessories Organizes in Washington and New York

Michigan Bloc Active

WASHINGTON, Dec. 9—Vigorous opposition already is being organized against the administration proposal to reinstate sales taxes on automobiles, trucks, tires and accessories. An automotive excise tax was recommended by President Hoover in his message to Congress, delivered today.

Leading the movement against the proposal to reinstate the taxes provided in the revenue act of 1924 is Representative Clancy, Republican, of Michigan. Mr. Clancy told *Automotive Industries* that the entire Michigan delegation of 12 members in the House is unalterably opposed to an automotive tax, and that with almost solid Democratic, as well as a considerable Republican opposition to motor vehicle sales taxes, any effort to enact them will be defeated.

Representative McLaughlin, of Michigan, Democrat, a member of the Ways and Means Committee, is active in opposing the proposed taxes and, with Mr. Clancy, was a strong force in having the previous taxes repealed after a 10-year struggle, led by the National Automobile Chamber of Commerce, and other automotive groups.

The administration proposes taxes of 5, 3 and 2½ per cent, respectively, on manufacturers' sales of automobiles, trucks, tires and accessories.

The 5 per cent sales tax would apply to automobile chassis and

(Turn to page 929, please)

Business in Brief

Written by the Guaranty Trust Co., New York, exclusively for Automotive Industries

NEW YORK, Dec. 9—The cold weather last week stimulated sales in seasonal lines, and the retail holiday business was much improved. The release of Christmas savings by the banks should further improve retail trade. From the incomplete reports available, it appears that holiday sales so far have not equaled last year's level. In some lines wholesale demand improved last week. Collections remained slow.

BUSINESS FAILURES

Commercial failures during November, according to R. G. Dun & Co., numbered 2195, as against 2362 during the preceding month and 2031 a year ago. Liabilities involved in the November failures totaled \$60,659,612, as against \$70,659,436 in October and \$55,260,730 a year ago.

ELECTRICITY PRODUCTION

Production of electricity during the week ended Nov. 28 was 4.3 per cent below that a year ago, while production during the week ended Nov. 21 was 3.9 per cent below that in the corresponding period last year.

BITUMINOUS COAL

Production of bituminous coal during the week ended Nov. 21 totaled 7,063,000 tons, as against 8,890,000 tons a year ago. Output of anthracite amounted to 911,111 tons, as against 1,081,000.

CAR LOADINGS

Railway freight loadings during the week ended Nov. 21 totaled 653,503 cars, which marks a decrease of 36,863 cars below those during the preceding week, a decrease of 126,249 cars below those a year ago, and a decrease of 296,213 cars below those two years ago.

CRUDE OIL OUTPUT

Average daily crude oil production for the week ended Nov. 28 amounted to 2,420,100 barrels, as against 2,453,400 barrels for the week before and 2,265,900 barrels a year ago.

FISHER'S INDEX

Professor Fisher's index of wholesale commodity prices for the week ended Dec. 5 stood at 67.6, as against 67.8 the week before and 68.6 two weeks before.

BANK DEBITS

Bank debits to individual accounts outside of New York City during the week ended Dec. 2 were 26 per cent below those a year ago.

STOCK MARKET

After several weeks of falling prices, the stock market last week showed rallying tendencies. The rallies, however, were held in check by depressing news, among which were the fall in sterling exchange to the lowest level in ten years, the receivership of the Wabash Railroad, and further dividend reductions and omissions. Trading was on a moderately increased scale. Net price changes for the week were irregular, with the railway issues showing the most substantial losses.

RESERVE STATEMENT

The consolidated statement of the Federal Reserve banks for the week ended Dec. 2 showed an increase of \$32,000,000 in holdings of discounted bills. There were decreases of \$56,000,000 in holdings of bills bought in the open market and of \$10,000,000 in holdings of Government securities. The reserve ratio on Dec. 2 was 65.6 per cent, as against 65.0 per cent a week earlier and 64.1 per cent two weeks earlier.

Prices Set on Graham

DETROIT, Dec. 7—Graham-Paige Motors Corp. will announce a new model eight on Dec. 19. Prices will be as follows:

Standard coupe	\$995
Standard rumble-seat coupe ..	1,045
Standard four-door sedan	1,045
De luxe coupe	1,070
De luxe rumble-seat coupe	1,120
Convertible coupe	1,170
De luxe sedan	1,120

Details of body and chassis improvements are being withheld until the public announcement, Dec. 10. The new Graham, however, has been identified as the "Blue Streak," to which reference has been made frequently during the past few weeks.

Milwaukee S.A.E. Meets

MILWAUKEE, Dec. 7—Transportation and mobile combat units being developed by the United States Army were explained before the Milwaukee Section, S.A.E., at the December meeting by Capt. Stewart E. Reimel, Ordnance Corps, Rock Island Arsenal, who substituted for Maj. L. H. Campbell, Jr. The talk was illustrated with motion and still pictures. Members of the Officers Reserve Corps and the Milwaukee Post, Army Ordnance Association, were especially invited guests. A demonstration also was given at the meeting of the fuel-testing motor developed at Waukesha Motor Co. under the direction of Harry L. Horning, president, and Arthur W. Pope, Jr., research engineer.

Navy Orders 2 Ford Planes

DETROIT, Dec. 7—Ford Motor Co. Airplane Division announces the receipt from the Navy Department of a contract for two specially equipped Ford 5-4 tri-engine transports, each to be powered with three Pratt and Whitney Wasp engines.

The special equipment includes a floor hatch for loading of spare engines, disappearing fuel bins in wing tips with a carrying capacity of 1600 lb., landing lights, parachute flares, 103 gal. reserve fuel tanks and chromium plated mast and brackets for mounting a wind-driven generator on the left engine nacelle for radio installation.

Making Welded Die Sets

MILWAUKEE, Dec. 7—The Superior Steel Products Co., 325 West McKinley Ave., formerly Superior Tool & Die Co., is now in quantity production on a new type of die set, fabricated from steel plate and having welded shanks and flanges, instead of being cast in gray iron. With the advent of the new product the company's accounts have increased 300 per cent. The plant is working 23 hours a day, six days a week and "extras" are finished on Sundays. Kasimir Janiszewski is president and general manager.

Vehicle Makers Shopping for Steel

Price Recessions
On Sheet Items
Open the Market

NEW YORK, Dec. 10—Manufacturers of low-priced motor cars have been doing intensive shopping in the sheet market with the result that sales of automobile body stock are reported to have been made this week on a 3 cent, Pittsburgh, basis, denoting a recession of \$2 a ton. Although announcements of higher first-quarter prices for some descriptions of finished steel come in for considerable newspaper publicity, they are regarded in the market as little more than an empty gesture. Very little out-and-out first quarter contracting is looked for.

A large part of the business placed over the remainder of December will be carried over into the first quarter of the new year, and so will very naturally the prices at which these orders are placed. With two-thirds of the capacity of steel mills available to take care of what bulge in the demand will develop, purchasing agents are not worrying very much about contract protection. Announcement of \$1 per ton advance by one of the Middle West strip mills implies a halt to the further disintegration of prices rather than upward revision of a heretofore recognized uniform price level.

Wire products going into automotive consumption are not affected by changes announced in the pricing system of leading wire mills this week, these pertain chiefly to wire nails and fence wire, etc.

Increase in steel ingot production by 1308 tons in November over October, disclosed by the American Iron and Steel Institute's report, made public on Monday, is remarkable chiefly because for the first time in five years November is shown to have topped October in production.

Pig Iron—Buying by automotive foundries continues to be chiefly in single carloads. The Michigan price for both malleable and foundry is nominally unchanged at \$17. Lower 1932 contract prices have been announced for ferrosilicon and ferromanganese.

Aluminum—Unchanged.

Copper—Agitation for a protective tariff on copper finds the producers divided into two camps. Several of the larger interests own extensive foreign properties while others are apprehensive lest a tariff injure their export business more than their domestic business would benefit. Pending more light on the details of the international agreement for reduction of the output and marketing of the surplus, the market is marking time.

Tin—Renewed weakness in the exchange market caused Straits tin to open at 20.60c on Monday, a decline of ¼c from last week's close.

Lead—Without heavy tonnage demand, the market is a routine affair, prices being unchanged.

Zinc—Latest statistical information shows an increase in unfilled orders with stocks of average proportions. The Joplin ore market advanced 50c a ton. Metal prices unchanged.

Bulk Financing Holds Up Well During 10 Months of 1931

WASHINGTON, Dec. 9—The volume of wholesale financing of automobiles showed relatively little decline, according to the preliminary figures for the first ten months of this year,

released today by the Bureau of the Census. For the first ten months of 1930 the dollar volume was \$595,802,812, while for the first ten months of the current year the volume was \$509,-

496,370. For October of this year the volume was \$25,779,782 compared with \$35,878,312 for October of last year. Retail financing figures are shown in the tabulations below.

Total Retail				New Cars				Used Cars			
1930	Number of cars	Volume and Average Total Amount Per Car		Number of cars	Volume and Average Total Amount Per Car			Number of cars	Volume and Average Total Amount Per Car		
Jan.	165,666	\$73,473,303	\$444	78,554	\$45,155,063	\$575		80,758	\$25,536,823	\$316	
Feb.	199,323	85,664,278	429	95,433	52,926,897	555		95,436	29,128,477	305	
Mar.	315,443	123,587,977	392	139,189	77,235,940	555		166,577	42,404,796	255	
April	346,590	146,700,652	423	171,032	93,935,742	549		164,063	48,782,480	297	
May	294,290	115,225,047	392	115,563	68,181,709	590		168,240	42,844,239	255	
June	340,872	138,207,191	405	159,649	91,122,753	571		170,404	42,983,279	252	
July	286,745	118,819,832	414	130,659	73,458,525	562		149,706	42,676,831	285	
Aug.	247,320	102,781,226	416	111,053	62,988,915	567		129,583	37,117,944	286	
Sept.	219,072	90,296,562	412	92,086	52,819,786	574		121,518	35,209,554	290	
Oct.	200,787	81,256,310	405	78,382	45,631,545	582		118,142	33,755,445	286	
Total..	2,616,108	\$1,075,912,378	\$411	1,171,600	\$663,456,875	\$566		1,364,427	\$380,439,868	\$279	
Nov.	152,338	60,197,277	395	54,682	31,805,159	582		94,082	26,841,820	285	
Dec.	167,299	65,967,172	394	61,888	35,342,181	571		101,076	28,838,221	285	
Total..	2,935,745	\$1,202,076,827	\$409	1,288,170	\$730,604,215	\$567		1,559,585	\$436,119,909	\$280	
1931											
Jan.	160,620	\$61,734,059	\$384	58,519	\$32,956,741	\$563		97,878	\$27,245,446	\$278	
Feb.	173,108	66,180,619	382	67,616	36,865,326	545		100,754	27,721,946	275	
Mar.	237,429	92,054,520	388	102,686	55,035,647	536		128,371	34,704,239	270	
April	290,270	113,045,193	389	133,376	70,560,629	529		149,188	39,564,067	265	
May	278,118	109,426,139	393	126,745	68,571,359	541		142,847	37,793,229	265	
June	265,564	104,698,405	394	115,128	63,565,852	552		141,982	37,999,214	268	
July	237,008	95,952,567	405	100,847	59,307,247	588		128,748	34,136,194	265	
Aug.	205,022	79,640,977	388	83,613	46,870,687	561		115,047	30,493,131	265	
Sept.	176,663	68,284,838	387	67,609	38,609,797	571		103,234	27,580,567	267	
Oct.	160,102	60,736,273	379	58,083	33,211,829	572		97,540	25,903,089	266	
Total..	2,183,904	\$851,753,590	\$390	914,222	\$505,555,114	\$553		1,205,589	\$323,141,122	\$268	

M.E.M.A. Elects

(Continued from page 921)

wholesaler relations; D. Beecroft, legislative, and M. A. Moynihan, Gemmer Mfg. Co., credit.

The N. S. P. A. elected V. W. Olson, Automotive Service Co., Minneapolis, Minn., president, and W. G. Hancock, McCord Radiator & Mfg. Co., Detroit, Mich., vice-president.

Directors are E. M. Sheehan, Motive Parts Co. of Pennsylvania, Pittsburgh; J. H. Northey, Southern Bearings & Parts Co., Charlotte, N. C., representing the association's wholesaler members, and Leo F. Hunderup, Van Norman Machine Tool Co., Springfield, and D. Rosenbach, W. D. Foreman Co., Chicago, representing the manufacturers' division.

High spots on the program of the second general session on Friday night included the presentation of the N. S. P. A. 1932 market development program, which provides for a continuation of the Maintenance Division activities by A. R. Sandt, Director of Marketing Research.

Fishleigh Looks Ahead

PHILADELPHIA, Dec. 10—Walter T. Fishleigh, consulting engineer, Detroit, and former executive engineer of the Ford Motor Co., told the local section of the S. A. E. last night that "big jobs are open in engineering leadership."

Referring to a recent article by Norman G. Shidle in *Automotive Industries* and an address made last

month before the Metropolitan Section by John A. C. Warner, manager of the S.A.E., he said: "These men have disclosed the reason why engineers have failed in leadership."

"Engineers are prone to poise over their draughting boards and spend their entire energy upon solving equations to three places of decimals instead of devoting that valuable time to searching for the vision of the car of tomorrow," he said.

Gets Soviet Order

CLEVELAND, Dec. 9—Eighteen special riveting machines, with auxiliary equipment, manufactured by the Cleveland Pneumatic Tool Co., will be sent to the Soviet automobile plant at Nizhni Novgorod, Russia, the Cleveland concern, has announced.

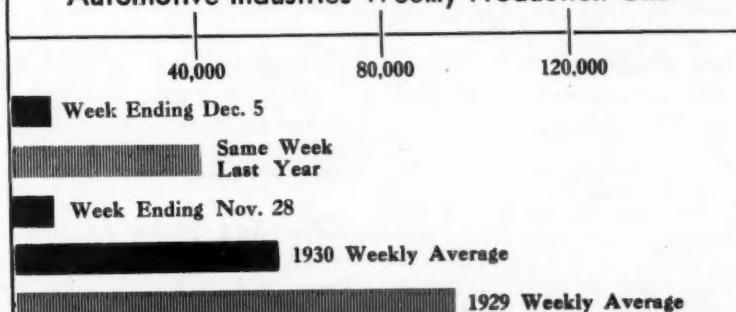
Salon Sales Reach \$1,000,000

NEW YORK, Dec. 7—Retail sales at the New York Automobile Salon, which closed last Saturday, were approximately \$1,000,000, according to the management. Attendance, as well as sales, was well ahead of last year and interest shown by visitors was keen.

Noblitt-Sparks Declares

CHICAGO, Dec. 7—Noblitt-Sparks directors declared a 40 cent quarterly dividend on common against one and one half per cent in stock and 75 cents in the previous quarter. The dividend is payable Jan. 1 to holders of record Dec. 19.

Automotive Industries Weekly Production Chart



Men of the Industry and What They Are Doing

Snodgrass is Named

At the recent meeting of the directors of the American-LaFrance and Foamite Corp., Elmira, N. Y., on Nov. 17, H. S. Snodgrass was appointed vice-president of the company in charge of all manufacturing operations.

Mr. Snodgrass joined the American-LaFrance and Foamite Corp. on May 1, 1927, in the capacity of purchasing agent and subsequently was made works manager. Previous to his entering the employ of American-LaFrance he was purchasing agent of the Moline Plow Co.; purchasing agent of Fageol Motors Co., and superintendent of production of American Car and Foundry Motors Co., Detroit.

Compton Relieves O'Connor

J. C. Compton, formerly manager of the Detroit branch of General Motors Truck Co., has been appointed manager of the Philadelphia branch, relieving P. E. O'Connor who has been acting as branch manager. W. A. Casey, formerly assistant manager of the Detroit Branch, succeeds Mr. Compton as manager.

Bauer Returns to U.S.

George F. Bauer, manager of the export department of the National Automobile Chamber of Commerce, returned Dec. 11 aboard the S. S. New York from a trip through the Far East. Mr. Bauer, who has been gone for seven months, went through Japan, Korea, China, Siam and India, giving illustrated lectures of the use of automobiles and the building, maintenance and use of highways.

Walter Carver Returns

Walter Carver, who has been special representative of General Motors Export Co. to Russia, returned to the United States this week. Mr. Carver has been away for a year and a half, spending most of his time studying possibilities of the market in the Soviet Union.

Lawson Visiting Plants

E. B. Lawson, automotive trade commissioner, who has been reassigned to South Africa, left Washington Dec. 6 to visit automotive manufacturing centers in the United States before taking up his new assignment. After spending Dec. 10-17 in Detroit, Mr. Lawson plans to be in Toledo Dec. 18-19, Cleveland Dec. 20-23, Philadelphia Jan. 6-8, Buffalo Jan. 9, and New York Jan. 11-16.

Morse Succeeds Hovey

Col. Robert H. Morse has been named president and general manager of Fairbanks, Morse & Co., succeeding W. S. Hovey, whose resignation was accepted at the recent directors' meeting.

Willys Visits Toledo

John N. Willys, ambassador to Poland, paid a secret visit of a few hours to Toledo, Dec. 7, and addressed a group of distributors for Willys-Overland in the Toledo Club. He is optimistic on the general automotive outlook.

Christman Joins Chrysler

Robert Christman, formerly experimental engineer of the Oakland Motor Car Co., has joined Chrysler Corp. engineering research staff.

Russell Names Sinclair

F. B. Sinclair, formerly branch manager in Los Angeles, Calif., for the Russell Mfg. Co., has been appointed manager of the Russell Mfg. Co., Ltd., factory in St. Johns, Quebec.

Developing 2 Devices

DETROIT, Dec. 8—Automotive Fan and Bearing Co., Jackson, Mich., has acquired a muffler design of the former Grey Muffler Co. and production is getting under way on a contract from an automobile manufacturer. Ralph W. Upson, designer of the Metalclad Airship and well-known aeronautical engineer, is at present developing a new flight instrument at the company's plant.

Valve-Seat Wear

In the article on Renewable Valve Seats in *Automotive Industries* of Nov. 21, where tests made by Edward M. Getzoff at the plant of the International Motor Co. were quoted, it was stated that the wear on cast-iron valve seats under the conditions described was 0.012 in. in 500 hours. Mr. Getzoff points out that the figure should have been 0.12 in.

Gardner Listing Removed

NEW YORK, Dec. 9—Capital stock of the Gardner Motor Co., Inc., has been stricken from the New York Stock Exchange.

Changes Show Dates

NEW YORK, Dec. 7—The Omaha Trade Association, Inc., has changed the dates of its show from Jan. 18 to 23 to Jan. 16 to 23.

Faulkner Views Outlook

NEW YORK, Dec. 8—Despite rumors pertaining to his future activities, Roy Faulkner, recently resigned Auburn president, insisted that he is not yet ready to announce his future plans, when interviewed here today. He has established headquarters at the Vanderbilt Hotel for a few days.

While reticent in discussing his personal plans at this time, Mr. Faulkner did talk freely about the outlook for the industry as a whole, voicing the opinion that the automobile shows this year will present more striking engineering developments than at any previous time.

"Production in 1932 probably will not exceed that of 1931 by any wide margin," Mr. Faulkner said, "but opportunity is wide open for assumption of new leadership by individual companies which combine outstanding engineering with practically fair treatment of dealers during the intensely competitive period which lies just ahead."

Testing New Tire

AKRON, Dec. 7—A new automobile tire to be known as the "doughnut," and designed to carry only 12 lb. of air pressure, will be placed on the market within a few weeks, it has been announced by the Goodyear Tire & Rubber Co. of Akron.

The new tire is an extension of the balloon-tire idea and was designed by Goodyear engineers to increase the shock-absorbing power of automobile tires.

The "doughnut" has been tried out for several months on small Goodyear test cars. Use of the new tire makes necessary a new auto wheel, with only 13-in. rim diameter, a reduction of 5 in. from the wheels needed for balloon tires. •

Early Technical Editor Dies

From Cleveland, Ohio, comes news of the death of Robert I. Clegg, first technical editor of *The Horseless Age*. Shortly after the establishment of the publication by E. P. Ingersoll in New York in 1895, Clegg undertook to edit its technical articles, to conduct the questions and answers department, and to contribute articles on motor vehicle design himself. He did this work from his home in Rhode Island and he remained with the paper until early in 1899 when it became a weekly and needed a resident technical editor. Later Mr. Clegg became connected with publications in the iron trade field.

Ford Releasing Parts Orders

Rouge Assembly Lines May Resume in Middle of Month

DETROIT, Dec. 9—Production orders on parts have been released during the past week by the Ford Motor Co. to its suppliers calling for a delivery schedule of 1000 per day during the last weeks of December. This would indicate that the Rouge plant assembly line would resume operation on the new models around the middle of December at the latest. Beginning of production on the new line it is reported has been facilitated by the reported decision of the Ford Motor Co. to use an automatic vacuum operated clutch in place of a mechanical free-wheeling unit. Installation of the latter at the rear of the transmission presented considerable difficulties in connection with the Ford torque-tube drive, while installation within the transmission would give free wheeling in only two forward speeds.

It is understood that synchronizing clutches are provided in the transmission to facilitate gear shifting between second and high. The cars will be much lower than formerly, with gasoline tanks in the rear and vee-shaped radiators, according to the most reliable reports available.

Ford Motor Co. officials still refused to discuss the forthcoming new model, although admitting that changes are being made in the cars. It is not expected that Ford plants will be assembling the new cars for some weeks, probably not until the middle or latter part of December. It is entirely possible though that Ford will announce before Jan. 1, even without cars available for any except the larger population centers.

Using Gemmer Units

DETROIT, Dec. 9—The Gemmer Mfg. Co. announced today that the cars named below will use its products for 1932. In addition to the appended list, Buick's two larger chassis will use the Gemmer worm and roller principle for steering. Under a royalty arrangement, Buick is licensed to procure the units for original equipment from the Saginaw Products Division of the General Motors Corp.

Car and Model	Type of Steering Gear
Chrysler De Luxe 8	Worm and roller
Chrysler Imperial	Worm and roller
Cord	Worm and roller
Dodge-8	Worm and sector
Essex	Worm and sector
Ford	Worm and sector
Franklin 6	Worm and roller
Franklin 12	Worm and roller
Hudson	Worm and sector
Hupp-F & I	Worm and roller
Lincoln	Worm and roller
Nash 1080	Worm and roller
Nash 1090	Worm and roller
Stutz—all models	Worm and roller
Willys-66D	Worm and sector
Willys-8-88D	Worm and sector
Willys-95	Worm and sector

Marvel Sales Increase

CHICAGO, Dec. 7—November sales of Marvel Carburetor Co., Flint, Mich., division of Borg-Warner Corp. of Chicago, showed a gain over October of approximately 30 per cent, C. S. Davis, president of the parent corporation, announces. He said the outlook for December business of the subsidiary company is favorable.

Auburn Declares Dividends

CHICAGO, Dec. 7—Directors of Auburn Automobile Co. have declared the regular quarterly dividend of \$1 a share, and in addition voted the usual stock dividend of 2 per cent. The same cash dividend has been paid since July 2, 1926, and the stock dividend from Jan. 2, 1927.

D. A. Corp. Reports Loss

DETROIT, Dec. 9—Detroit Aircraft Corp. reports net loss for six months ended June 30 of \$233,433 after allowing for engineering promotional sales effort and development costs. Current assets as of June 30 were

Midland Adding Equipment

CLEVELAND, Dec. 9—The Midland Steel Products Co. is installing additional equipment at its Cleveland plant for the production of its new axle housing, the result of orders recently received from the makers of a new light car. Midland frames will also be used on this car.

\$584,967, of which \$22,097 was cash, against current liabilities of \$291,145 cash.

Robert C. Hupp

DETROIT, Dec. 8—Robert C. Hupp, who organized the Hupp Motor Car Co. in Detroit in 1908, died on Dec. 7 at the Detroit Athletic Club as the result of a cerebral hemorrhage. He was 70 years old. Mr. Hupp became president and remained at the head of the company for about two years, when he severed his connection with it. A short time later he formed the R.C.H. Co. in Detroit to manufacture automobiles. This company had a meteoric career. Organized in 1911, it put on the market a car which caught the public fancy by its appearance, and operations soon reached a large scale, but the car did not stand up well in users' hands and the company was placed in receivership in 1913. Many of the leading parts concerns were heavy creditors, and when the affairs of the company were finally wound up the total losses to creditors amounted to more than a million. Since the failure of the R.C.H. Co. Mr. Hupp had not been prominently connected with the automobile industry.

Borg Gets Rockne Orders

CHICAGO, Dec. 7—Borg-Warner is supplying the clutch, radiator, transmission, free wheeling and universal joints for the new Rockne six being introduced by Studebaker.

General Motors Has 313,117 Stockholders, Largest Number in Its History

NEW YORK, Dec. 7—The number of stockholders having securities of the General Motors Corp. had reached a new high figure when the corporation's books were closed for payment of dividends declared for the third quarter.

The total number of General Motors common and preferred stockholders at this point in the fourth quarter of 1931 was 313,117, compared with 293,714 for the third quarter of 1931 and

with 263,528 for the fourth quarter of 1930.

There were 295,961 holders of common stock and the balance of 17,156 represents holders of preferred stock. These figures compare with 276,476 common stockholders and 17,238 preferred for the third quarter of 1931.

The total number of stockholders of both classes by quarters since 1917 is shown in the tabulation below:

Year	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
1917	1,927	2,525	2,669	2,920
1918	3,918	3,737	3,615	4,739
1919	8,012	12,523	12,358	18,214
1920	24,148	26,136	31,029	36,894
1921	49,035	59,059	65,324	66,837
1922	70,504	72,665	71,331	65,665
1923	67,115	67,417	68,281	68,063
1924	70,009	71,382	69,428	66,097
1925	60,458	60,414	58,118	50,917
1926	54,851	53,097	47,805	50,369
1927	56,520	57,595	57,190	66,209
1928	72,986	70,399	71,682	71,185
1929	105,363	125,165	140,113	198,600
1930	240,483	243,428	249,175	263,528
1931	286,378	285,655	293,714	313,117*

*Preferred stockholders of record Oct. 5, 1931, and common stockholders of record Nov. 14, 1931.

New Attempts Launched for an All-Australian Passenger Car

One company in Melbourne and one in Sydney proceed with plans for use of local units in broad program of manufacture and sale

EDITOR'S NOTE: During the past two years, under the stimulus of drastic protective tariffs, eight attempts have been made to establish locally-owned automobile plants in Australia. Each of these attempts has met with little success. Two more ventures are being currently launched, one in Sydney and one in Melbourne. The Melbourne correspondent of Automotive Industries has made a careful study of these. In presenting his analysis, we desire to call attention to the fact that it is difficult to estimate the importance of the projects at the present state of development. Such facts as are available are based entirely upon the claims of the promoters and caution is necessary in considering them.

A series of articles on Australian automotive conditions written by Hugh Croll, especially for Automotive Industries, appeared in this publication on Sept. 27, Oct. 4, and Nov. 1 of 1930. In the last article of the series, Mr. Croll, whose conclusions were based on first-hand study and written on the ground, predicted that an all-Australian car was definitely in the offing. With this in mind, and recognizing wide American interest in the subject, Automotive Industries will continue to present, as they become available, the current facts in the Australian situation.

Australian Made Motor Cars & Aeroplanes Ltd., 16 Hunter St., Sydney, N.S.W., was registered as a limited liability company on Aug. 21, 1929, with an authorized capital of £2,000,000 in £1 shares. To carry on the business of manufacturers of and dealers in Australian made motor cars, vehicles, etc. Subscribers were: Edward M. Davies, Charles W. Butler, Charles W. Davies, Joseph M. Bunting, Cecil W. Bennett, Arthur C. Hopwood and Ernest J. Curtin (1 share each). First directors were the Hon. D. J. Malone, Edward M. Davies, Charles W. Butler, and Charles W. Davies. Of the shares, 50,000 were offered for public subscription, payable 2/6 per share on application, 2/6 per share on allotment and the balance in calls of 1/6 per share at intervals of not less than one month; 1,500,000 shares were held in reserve. In a prospectus issued by the company, it was estimated that they would produce 5000 cars per annum on which a net profit of not less than £25 per

car would be made, making a total net profit of £125,000 to be disbursed as follows: Taxation, £26,500, 10 per cent dividend £50,000 and to reserves £48,500. The capital outlay (uncertified) was set down at land (20 acres) £10,000, buildings £50,000, plant £270,000, including foundry plant, £60,000 forge plant £60,000, machinery £100,000, assembly equipment £30,000, stores equipment £20,000, company formation £2,000, expenses prior to production £10,000, underwriting and brokerage £25,000, working capital £133,000.

There was no mention of promoters' consideration, neither was there any reference to a cash consideration.

Preliminary expenses were estimated at £2,000.

The directors are men of good repute and standing, E. M. and C. W. Davies are well-known in the motor trade, having been for years associated with Davies & Davies Ltd., motor car agents, Sydney, and have a thorough knowledge of this class of trade.

E. M. Davies is not disposed at this juncture (Aug. 10, 1931) to furnish any detailed information in regard to the company's affairs beyond stating that the company will be producing cars in Australia early next year. No information has yet been made known in regard to issued shares or paid-up capital, but it is claimed that a good response has been received in connection with the sale of shares and it is anticipated that the first issue will be fully subscribed.

The company has acquired an area of 3970 acres of land between St. Marys and Kingswood, where a factory will be erected. Plans of subdivision for the land have been approved by the St. Marys Council and a town site will be selected for the company's employees. It is intended by the company to build a 24 hp. car to be sold for about £300 as against £550 for an imported car of the same kind. It is stated the erection of the factory has been commenced and that when the company is in full working order, it is hoped that upwards of 5000 men will be employed. No further information has been made available concerning the issued shares or paid up capital and under further interview the principals of the company declined for the time being to furnish details.

On Aug. 8 it was reported that there

were 650 shareholders on the share register of the company, but the actual number of shares issued, or the amount of paid-up capital was not disclosed. The directors, however, definitely closed the present issue of ordinary shares in the company on July 31, 1931, and it notified the issue of £250,000 First Mortgage Serial Building Bonds in denominations of £5 up to £1,000. Interest: 8 per cent per annum. Two directors to be appointed by the Bondholders. Solicitors to the Trust Deed are Samuelson and Cowie, 115 Pitt St., Sydney, and auditors to the Trust Deed are George Sinclair & Co., 16 Hunter Street, Sydney.

The bonds are redeemable as follows: £50,000 redeemable at 102, Aug. 1, 1925; £100,000 redeemable at 102, Aug. 1, 1936; £100,000 redeemable at 102, Aug. 1, 1937. Security: First Mortgage Debenture on the assets of the company and a First Lien upon the net annual earnings, conservatively estimated at a minimum output of £98,250 per year.

The completion of the building will be guaranteed by surety bond issued on behalf of the contractor, and machinery and effects will be purchased on a guarantee by Australian, British and American tool manufacturers, supplying the company covered by surety bond to supply machinery within six months on receipt of contract.

The factory and machinery is being established to secure a minimum output of 100 cars per week of one shift; with three shifts, the results will be increased to 180 per cent.

The allocation of bond money will be as follows: Buildings and improvements £100,000, machinery £150,000. The present directors are E. M. Davies, Hon. D. J. Malone and C. W. Butler. Secretary: C. W. Davies.

It is claimed that the company is prepared to pay cash for immediate purchases and expects to place cars on the market early in 1932.

All-Australian Car

An all-Australian car is announced for production in Melbourne this year. It is planned to sell with five-seater saloon bodywork at £500, and is to be constructed by J. T. Buckingham and A. T. Ward, motor engineers, of 205 Buckley St., Footscray, Victoria. The car will be called the Hamard Six. It will be of American type and appearance, though of Australian design, built of Australian and British raw materials throughout.

Messrs. Buckingham and Ward state that the first chassis frames will be produced by Mephan and Ferguson, while the United Engineering and Malleable Co. will produce all the required castings and the Richardson Gears Co. will provide the steering, gear box and back axle gears.

(Turn to page 930, please)

Canadians Fix Standards for Free Wheeling Lubricants

TORONTO, Dec. 7—Quick work in bringing together Canadian oil manufacturers and automobile manufacturers will result in the announcement shortly of special oils for cars fitted with free-wheeling transmissions. At a meeting held last week between the Canadian Automobile Standard Association, an affiliated organization of the Canadian Automobile Chamber of Commerce, and leading car manufacturers, three standard specifications for transmission oil for use in cars fitted with the free-wheeling device were decided upon and a common designation given to each oil. The first of these free-wheeling transmission oils will be designated 110-FW, suitable for use in a free-wheeling transmission at a temperature of above plus 35 deg. Fahr. The second will be 90-FW, suitable for use above a temperature of plus 15 deg. Fahr., while the third will be designated 80-FW, suitable for use in a temperature of above minus 15 deg. Fahr.

Rockne Getting Under Way

DETROIT, Dec. 9—Production of the larger Rockne, Model 75, will get under way at the Studebaker factory in South Bend about Dec. 15 in order to sample dealers by the first of the year. It is not likely that the 65 will be in production at the Detroit plant before the middle of January. No 65's will be built in South Bend.

Inspects Canadian Locations

WINNIPEG, Dec. 7—George P. Castner, vice-president of the National Battery Co. of St. Paul, Minn., was in Winnipeg today inspecting sites for the establishment of a Canadian branch of the company to be established here. Decision to open a plant in Canada was reached largely owing to the effects of Dominion tariffs, he said.

Wayne Co. Sales Taper 23 Per Cent

DETROIT, Dec. 7—Registrations in Wayne county during November totaled 1349, a decrease of 28 per cent from the October total of 1882 and a decrease of 23 per cent from the November, 1930 total of 1768.

Ford was first with 405, Chevrolet second with 313, Plymouth third with 90, Buick fourth with 82 and Essex fifth with 57.

Commercial car registrations last month totaled 179, against 293 for October and 409 for November last year. Ford was first with 100, Chevrolet second with 32 and G.M.C. third with 11.

Charge of Government Aid to Motor Carriers to Be Sifted

I.C.C. Plans Investigation of Railroads' Competitor as Part of General Program to Determine Whether Restrictions Are Warranted

WASHINGTON, Dec. 10—Investigation to determine whether motor, water and air carriers operating in competition with the railroads are receiving direct or indirect government aid, amounting, in effect, to a subsidy, is sought by the Interstate Commerce Commission.

Released today, its annual report includes such an investigation among its 19 recommendations, some of them unusually broad in their purpose. In asking Congress to provide for "an impartial and authoritative investigation," the Commission suggests that the inquiry be made to determine, if charges of subsidy aid to competing carriers are proved, what steps, if any, are necessary to correct this situation, "with a view to placing competition on a just and equitable basis."

Directing possible action especially at motor competition, the Commission recommends that the investigation, if instituted, "might well be extended to cover also the question of whether it is desirable in the public interest that regulations affecting public safety and convenience in the operation of motor carriers be made uniform throughout the country, and, if so,

how such uniformity may best be brought about."

The Commission, dealing further with proposed motor regulation, a subject that will undoubtedly be given consideration at the present session of Congress, suggests that the law be amended so as to require that the rates and practices of forwarding companies engaged in interstate commerce shall be reasonable and non-prejudicial. Like railroad carriers, forwarding companies would be required to file tariffs with the Commission and to strictly adhere to them, with penalties for departures or for the granting of rebates or other concessions.

The Commission repeats previous recommendations for regulation of motor buses in interstate commerce over regular routes or between fixed termini, and points out that in its forthcoming report of Coordination of Motor Transportation soon to be made it will undoubtedly make recommendations with respect to the public regulation of interstate operations of motor trucks. The Commission said it cannot "undertake to forecast what those recommendations may be."

October Financing in Dominion Holds

OTTAWA, Dec. 7—Volume of automobile financing in Canada was higher in October, when a total of 6411 vehicles were financed to the value of \$2,653,387. The figure for September was 5957 vehicles, valued at \$2,613,934. The average value of loan per car was therefore lower in October, being \$414, as against \$439 in September.

Of the total, 1889 were new cars against 1767 the previous month, the value being \$1,323,443, compared with \$1,239,434; while used cars financed numbered 4522 in October, as against 4190 in September. The value of the latter class, in spite of the substantially greater number, was down from \$1,374,500 to \$1,329,944.

Compared with October, 1930, there was an increase of 2.7 per cent this year in the value of new cars financed, notwithstanding the fact that the number was 18½ per cent lower, which would indicate that either more expensive cars were bought or the cash payments were higher. Reduced value of trade-ins would also account for the higher values financed.

For the year to date the total number of new and used vehicles financed

is 88,536, with value of \$37,959,950, the number being 22.85 per cent, and the value 33.39 per cent lower than for the same 10 months last year.

Chrysler Sales Increase

DETROIT, MICH., Dec. 10—Shipments to Chrysler Sales Corp. dealers for the first eleven months of this year show an increase of 10.7 per cent over the same period in 1930, according to a statement authorized here today by J. W. Frazer, general sales manager of the company.

Total shipments up to Dec. 1 of this year were 90,706 as compared with 81,957 for the same period in 1930.

Shipments of Chrysler Sixes for this same period this year totaled 33,467 as compared with 25,059 for the first eleven months of 1930, an increase of 33.6 per cent, the statement said.

Plymouth Shipments Up

DETROIT, Dec. 9—Plymouth shipments to dealers during the first ten months of this year were 145.4 per cent of shipments during the same period last year, according to H. G. Moock, general sales manager.

Standards Bureau Reports for Year

Director Cites Work Done on Engine and Fuel Problems

WASHINGTON, Dec. 9—During the past fiscal year the Bureau of Standards, according to the recently issued report of its director, did considerable work on automotive engine problems, for which purpose a fund of \$50,000 was available. Following is a summary of the projects worked on.

Temperature measurements in airplane fuel systems show that many airplanes now in service require gasoline with low vapor pressure to insure freedom from vapor lock. Results of laboratory experiments suggest improvements in fuel system design which would permit the use of better fuels. Similar work with automobiles points to improper design of fuel systems as the major cause of vapor lock. As a result of this investigation, extensive changes are being made in forthcoming models, which will go far to minimize vapor-lock troubles.

The octane number detonation scale has been adopted as recommended practice by the Society of Automotive Engineers. Approval of the test engine, developed by the cooperative fuel-research steering committee, is expected to follow completion of final tests now in progress. Definite procedure for testing motor fuels has been tentatively adopted and will soon be given final form. The objectionable feature of automobile engine detonation is noise; that of aircraft engines is overheating and mechanical shock. Recognizing this difference, the bureau initiated cooperative research on methods of measuring detonation of aviation fuels. The first symposium on this subject indicated need for such research, the results obtained by different methods being quite diverse.

Theoretical and experimental studies of gaseous explosions in constant volume bombs have been made to aid in interpreting recent stroboscopic observations of flame movement and pressure development in an engine cylinder. Preliminary measurements indicate that the progress and character of the explosion in the engine may also be investigated by analysis of the infra-red radiation through fluorite windows in the cylinder head.

Using the soap bubble as a constant-pressure bomb, the relation between explosion temperature and rate of transformation in homogeneous mixtures of explosive gases at constant pressure is being studied in cooperation with the National Advisory Committee for Aeronautics.

An investigation is in progress to develop significant test methods for determining the gum content of gaso-

lines and its tendency to increase under storage conditions.

The safety code for brakes and brake testing, for which the bureau and the American Automobile Association were joint sponsors, is to be revised in view of the widespread use of 4-wheel brakes. The personnel of the revised sectional committee for this project was approved June 4 by the council of the American Standards Association.

New Studebaker Prices

SOUTH BEND, IND., Dec. 10—The following models, body types, and prices will be effective for Studebaker products as the company enters the 1932 market. Regal and St. Regis types carry de luxe equipment, including six wheels and a variety of equipment options:

Studebaker 6

Type	Price
Two-passenger coupe	\$840
Regal coupe	945
Rumble seat coupe	890
Rumble seat Regal coupe	995
St. Regis brougham—five pass.	890
Regal St. Regis brougham	995
Five-passenger sedan	890
Regal sedan	995
Convertible roadster, rumble seat	890
Regal convertible roadster	995
Five-passenger convertible sedan	955
Regal convertible sedan—5 pass.	1,060

Dictator 8

Type	Price
Two-passenger coupe	\$980
Regal coupe	1,085
Rumble seat coupe	1,030
Regal coupe—4 pass.	1,135
St. Regis brougham	1,030
Regal St. Regis brougham	1,135
Five-passenger sedan	1,030
Regal sedan	1,135
Convertible roadster rumble seat	1,030
Regal convertible roadster	1,135
Five-passenger convertible sedan	1,095
Regal convertible sedan	1,200

Commander 8

Type	Price
Rumble seat coupe	\$1,350
Regal coupe	1,455
St. Regis brougham	1,350
Regal St. Regis brougham	1,455
Five-passenger sedan	1,350
Regal sedan	1,455
Convertible roadster—4 pass.	1,350
Regal convertible roadster	1,455
Five-passenger convertible sedan	1,415
Regal convertible sedan	1,520

President 8

Type	Price
Rumble seat coupe	\$1,690
State coupe	1,795
St. Regis brougham	1,690
State St. Regis brougham	1,795
Five-passenger sedan	1,690
State sedan	1,795
Convertible roadster—4 pass.	1,690
State convertible roadster	1,795
Convertible sedan	1,780
State convertible sedan	1,885
Seven-passenger sedan	1,790
Seven-passenger State sedan	1,895
Seven-passenger limousine	1,890
Seven-passenger State limousine	1,995

Hudson Contributes

DETROIT, Dec. 7—Employees and executives of the Hudson Motor Car Co. have contributed \$50,000 for unemployment relief. This fact was omitted from the article appearing in the Nov. 21 issue of *Automotive Industries*.

Airplane Sales Near 1930 Mark

First Nine Months Show Increase in Light Engines

NEW YORK, Dec. 10—Reports from more than 50 airplane manufacturers and 18 airplane engine producers during the first 9 months of 1931, show that the cumulative total value of commercial and military engine sales were only \$2,500,000 less than during the same period of 1930.

Total deliveries (sales) valued at \$27,971,888 were reported during the first three quarters of the current year, as compared with \$30,530,246 in 1930. Production of airplanes and engines in 1931 totaled \$26,606,192 as compared with \$29,419,466 during the first three quarters of 1930—a drop of about \$3,000,000.

Fifty per cent of the total value of production and deliveries during the first nine months of 1930 was traceable to military activity, while during the same period of 1931, 63 per cent of the total value is from military orders.

Production of commercial airplanes in the nine month period of 1931 totaled 1411 units valued at \$5,748,080, while 1671 units valued at \$9,201,270 were reported in 1930. Deliveries up to October, 1931, totaled 1419 units valued at \$6,455,763 as compared with 1967 units with a value of \$9,691,334 in 1930.

During the first three quarters of 1931, 1743 commercial engines were produced at a value of \$3,422,651, and 1778 units delivered and valued at \$3,789,276. During the same period of 1930, 1638 units, valued at \$5,369,399 were produced and 1669 units with a value of \$5,427,252 delivered.

The large number of light engines produced and sold in 1931 swelled the total number above that of 1930, but the 1931 value dropped about \$2,000,000.

Military airplane production increased from 479 units in the first three quarters of 1930, to 615 planes during the same period of 1931. Value of production increased also from \$6,861,475 in 1930 to \$9,517,776 in 1931. Deliveries in 1931 totaled 615 units at \$9,499,523 as compared with 532 units (\$7,271,763) in 1930.

Military engine production and deliveries remained practically unchanged in 1931 from the 1930 level. During the first nine months of this year, 1360 units valued at \$7,897,685 were produced, while during the same period of 1930, 1353 units valued at \$7,987,322 were reported. Similarly, deliveries in 1931 totaled 1395 units valued at \$8,277,326 as compared with 1396 units at \$8,139,897 in 1930.

Graham Line Shown in Detroit

"Blue Streak" for 1932 Makes Liberal Use of Silencing Materials

DETROIT, Dec. 9—The local Graham-Paige distributor is now showing the 1932 line of Graham Eight cars, known as the "Blue Streak." The cars are priced at from \$100 to \$200 below last year's levels.

The new line is distinguished for its striking streamlined appearance. The body is set low on the frame, and all basic lines of the outline are carried in sweeping curves to the rear.

The frame structure, permitting of lowering the body without going to an excessive kick-up at the rear end, free wheeling in all forward speeds, silent second, synchronized shifting and dash-regulated ride control are some of the features of the new line. Centrifuge brake drums are used.

Rubber mounting of engine and springs, a new exhaust silencer, carburetor—intake silencer, and liberal use of rubber dough and sound-deadening material throughout the chassis and body have eliminated much of the usual motor car noise.

New Tax Proposal

(Continued from page 921)

bodies and motorcycles, including tires, inner tubes, parts and accessories.

The 3 per cent tax would apply to automobile truck chassis and automobile chassis sold or leased for an amount in excess of \$1,000 and automobile truck bodies and automobile wagon bodies sold or leased for an amount in excess of \$200, including in both cases tires, inner tubes and parts.

The 2½ per cent tax would apply to tires, inner tubes, parts and accessories.

Declaring that it would be unfair to reinstate these taxes on an industry which is already suffering severely from the depression and would further retard it, Mr. Clancy said it would mean a burden of at least \$200,000,000 annually. This would be in excess of 20 per cent of the entire revenue of \$920,000,000 which the President estimated all the proposed taxes would raise yearly. He suggested that the increased tax apply for two years from next July as a means of partially meeting the enormous U. S. Treasury deficit.

"The Democrats in the House in the past have declared against these taxes on motor vehicles," said Mr. Clancy, "and I am sure they will oppose them again. There are also many Republicans in the House who are opposed to the taxes. With the House made up of 219 Democrats and 215 Republicans and Progressives, it will be seen that the taxes cannot be enacted.

There is also strong opposition in the Senate against the taxes, especially among Democrats.

"Taxing the automobile industry would be a boon for bringing back the horse and buggy, for it certainly would have a decidedly depressing effect on the automotive industry."

It is proposed to take up tax legislation at an early date. Hearings undoubtedly will be held by the Ways and Means Committee, which originates all revenue legislation. The automotive industry already has indicated that it will make vigorous protest against sales taxes.

N.A.C.C. Organizes Protest

NEW YORK, Dec. 9—Coincident with the issuance today of Secretary Mellon's proposed program for special taxes, the directors of the National Automobile Chamber of Commerce issued a statement of policy regarding taxation. In this statement, the directors reiterated their former stand against any discriminatory taxes and urged that before any movement was made toward increasing federal taxation, the government should institute exhaustive economies in its own expenditures, and urged further limitation of world armaments.

This policy was drawn up by a special committee of the chamber, of which Roy D. Chapin, chairman of the board of Hudson Motor Car Co., is chairman, and of which the other members are: Walter P. Chrysler, president of Chrysler Motor Corp.; A. R. Erskine, president of Studebaker Corp.; C. W. Nash, president of Nash Motors Co.; Robert P. Page, Jr., president of Autocar Co., and Alfred P. Sloan, Jr., president of General Motors Corp.

In this declaration, the chamber takes the stand that if increased taxation is unavoidable, it should be distributed over all income, individual, industrial and otherwise. If any certain industries are selected to bear the brunt of this burden, the result will be a complete disjunction of the economic situation, resulting in increased unemployment and decreased purchasing power by the American laboring man.

Besides the special taxation committee, other directors of the chamber who approved the declaration are: A. J. Brosseau, president of Mack Trucks, Inc.; E. L. Cord, president of Auburn Automobile Co.; Robert C. Graham, vice-president of Graham-Paige Motors Corp.; Charles D. Hastings, chairman of the board of Hupp Motor Car Corp.; F. J. Haynes, treasurer of the National Automobile Chamber of Commerce; Alvan Macauley, president of Packard Motor Car Co.; William E. Metzger, vice-president of Federal Motor Truck Co.; L. A. Miller, president of Willys-Overland, Inc.; Alfred H. Swayne, vice-president of General Motors Corp., and Robert W. Woodruff, chairman of the board of White Motor Co.

Mooney Deplores Isolation of U. S.

Says European Markets Closed to American Cars

NEW YORK, Dec. 8—The United States has definitely isolated herself economically through the efforts of high protective tariffs from the commercial markets of the world, James D. Mooney, vice-president of General Motors Corp. in charge of export activities, said last week on his return from Europe.

While the American automobile still leads the world in speed, style, comfort and value, it has met practically an impasse in the European market in the form of protective tariffs, he pointed out. In England, France and Germany, the American car, which formerly had excellent sales, is now practically dead. Spain and Italy, with their high tariffs, virtually exclude American cars. Denmark has raised its duties in a way that will penalize American cars in the medium-priced class, and Sweden will probably take similar steps within the next few months. The Balkan nations are using the quota system to limit the use of American cars.

Because of the American tariff and the tariff reprisals instituted by the European countries, international trade is broken down. American foreign trade is particularly difficult today because in addition to the tariff situation, we have an exceedingly difficult foreign exchange situation in those countries that have abandoned the gold standard. Dollars are difficult to get in these countries because their shipments of goods to America have been cut off and they have no dollar credit to exchange for our products.

Pointing to the movement in Europe toward bilateral trade agreements, Mr. Mooney urged that the United States should take steps to reach similar agreements with European countries. While it is extremely improbable there will be any world economic disarmament conference, we can, he believes, enter into agreements with our customer nations whereby we will not be discriminated against in tariff wars. There are signs that some of the countries abroad are contemplating scrapping the most favored nation clause and getting together with each other in developing mutually satisfactory trade agreements. Mr. Mooney expresses the devout hope that the United States will not fail to undertake such arrangements, too.

Chrysler Shipments Increase

DETROIT, Dec. 7—Total shipments to Chrysler Sales Corp. dealers up to Dec. 1 this year were 90,706, against 81,957 for the same period last year, a 10.7 per cent increase.

Rolls Acquire Bentley Firm

Improves Its
Position in
Fine Car Field

(Special Correspondence)

The disposal of Bentley Motors, Ltd., makers of the famous Bentley car, which has achieved so many records both for speed and endurance, has caused a succession of surprises. The company applied for the appointment of a receiver last July, and it was later announced that the business would be taken over by D. Napier & Son, Ltd., motor manufacturers, upon which Napier shares rose considerably on the stock market.

Just as the Napier negotiations were on the point of conclusion, the British Equitable Central Trust, Ltd., offered a higher bid. The Trust announced its intention of merging the Bentley concern with certain steel interests established in the north of England.

However, this plan did not go through, and a bid for the business from Rolls-Royce, Ltd., was accepted.

Rolls-Royce, Ltd., have naturally suffered fairly heavily from the depression, as makers of Britain's highest-priced and highest-taxed car. Sales of the 44-hp. Rolls-Royce Phantom II, on which the annual tax amounts to \$220 (at par), have fallen from 456 in the year ending Sept. 30, 1930, to 211 in the year ending September 30, 1931.

Some two years ago a less expensive model, paying only \$125 annual tax, was introduced and has done much to maintain the company's business. Net profit for 1930 was £147,171, compared with £201,706 for the previous fourteen months, or roughly £172,900 for 1929, shareholders again receiving 10 per cent.

To overcome the high cost of maintaining complete sales and servicing organizations overseas, which has become almost unbearable in times such as these, an arrangement was made between the French and Indian subsidiaries of Rolls-Royce, Ltd., and the firm of Rootes, Ltd., the export distributors of the Humber, Hillman and Commer combine, by which overhead expenses might be shared. Thus, while the costly Rolls-Royce may make little headway against the present economic gale, some relief will be available from the sale of the cheaper cars now associated with it in the French and Indian markets.

Indeed, one might have expected Rolls-Royce to have adopted a similar policy in the United Kingdom, and, instead of acquiring a car competing in its own restricted market, to have obtained an interest in a price-class to which the greatest proportion of new car sales is likely to go for the next year or two.

+ + CALENDAR + + OF COMING EVENTS

SHOWS

Buenos Aires, S. A., Automobile.	Dec. 18-27
National Automobile, New York.	Jan. 9-16
San Francisco, Automobile.	Jan. 9-16
Newark, N. J., Automobile.	Jan. 16-23
Omaha, Neb., Automobile.	Jan. 16-23
Cincinnati, Automobile.	Jan. 17-23
Milwaukee, Wis., Automobile.	Jan. 17-23
Philadelphia, Automobile.	Jan. 18-23
Louisville, Ky., Automobile.	Jan. 18-23
Boston, Mass., Automobile.	Jan. 23-30
Minneapolis, Minn., Automobile.	Jan. 23-30
Hartford, Conn., Automobile.	Jan. 23-30
Detroit, Automobile.	Jan. 23-30
Montreal, Automobile.	Jan. 23-30
Baltimore, Automobile.	Jan. 23-30
Pittsburgh, Pa., Automobile.	Jan. 23-30
Portland, Ore., Automobile.	Jan. 23-30
Springfield, Mass., Automobile.	Jan. 25-30
Harrisburg, Pa., Automobile.	Jan. 25-30
St. Petersburg, Fla., Automobile.	Jan. 27-29
National Automobile, Chicago,	Jan. 30-Feb. 6
Salon, Chicago.	Jan. 30-Feb. 6
Washington, D. C., Automobile.	Jan. 30-Feb. 6
Cleveland, Automobile.	Jan. 30-Feb. 6
Springfield, Ill., Automobile.	Feb. 4-6
St. Paul, Automobile.	Feb. 6-13
St. Louis, Automobile.	Feb. 7-13
Denver, Colo., Automobile.	Feb. 8-13
Salon, Los Angeles, Calif.	Feb. 13-20
Kansas City, Automobile.	Feb. 13-20
Mankato, Minn., Automobile.	Feb. 17-20
Peoria, Ill., Automobile.	Feb. 17-21
Holyoke, Mass., Automobile.	Feb. 18-22
Des Moines, Iowa, Automobile.	Feb. 21-26
Wichita, Kans., Tractor and Power Equipment.	Feb. 23-26
Salon, San Francisco, Calif.	Feb. 27-Mar. 5
Albany, N. Y., Automobile.	Feb. 27-Mar. 5
Berne, Switzerland, Automobile.	Mar. 11-20
National Aircraft, Detroit, Mich.	Apr. 2-10

CONVENTIONS

American Roadbuilders Association,	Detroit, Mich.	Jan. 11-14, 1932
S.A.E. Annual Dinner, New York City,		Jan. 14
S.A.E. Annual Meeting, Detroit, Mich.,		Jan. 25-29

A few months ago *Automotive Industries* published a report that shareholders in the American Rolls-Royce company were demanding a reduction in the quota, which is a basic arrangement with the parent company, by which five cars a week must be imported from the Derby factory, England. The drop in sterling has certainly assisted the American organization, but there are believed to be less than two thousand Rolls-Royce cars in the United States, and the length of time which Rolls-Royce lasts keeps down replacement demand.

A. F. Sidgreaves, managing director of Rolls-Royce, stated that a subsidiary company to carry on the Bentley business is being considered.

All-Australian Car Projected

Two Companies
Have Plans for
Locally Made Units

(Continued from page 926)

The Henderson Federal Spring Works will produce the springs, brakes and connecting rods; the electrical equipment will be produced in Fitzroy, while the Government Munitions Establishment, Maribyrnong, will bore the cylinder blocks and produce the radiators, headlamps, axles, crankshafts and wheels.

The engine will have a seven-bearing crankshaft, full-pressure lubrication, cast-iron pistons, overhead valves, coil ignition and pump cooling, the design being fairly similar to the 1929 Buick engine.

A dry plate multiple disk clutch and a three-speed gear box will be used, the final drive being of the Hotchkiss type to a pressed-steel back axle of the semi-floating type. British roller-bearings and ball-races will be used throughout.

Messrs. Buckingham and Ward have been in the motor trade in Australia for many years, and their new venture is backed by a newly formed proprietary company with £10,000 capital, the shares in which will be held privately. They state that the production of an Australian car would be impossible but for the unequalled engineering plant now available at the Government's Munition Establishment at Maribyrnong.

Two cars will be produced first, and time and cost checkers will watch the production of all components in the various factories. From the data obtained it is hoped that full estimates will be completed to allow the company to expand and secure capital to back a program of quantity production.

Gets Patent Decision

NEW YORK, Dec. 10—Motor Improvements, Inc., has been upheld by the Supreme Court of the United States in its patent suit against the AC Spark Plug Co. and General Motors Corp., covering oil filters. A permanent injunction has been issued prohibiting AC Spark Plug Co. and the General Motors Corp. from making, using or selling the infringing device. A master has been appointed to determine the amount of damages payable to Motor Improvements, Inc., because of the infringement, and he has called for records of manufacture to be submitted by Dec. 15. Officers of the General Motors Corp. have repeatedly declined to offer a statement regarding the decision.

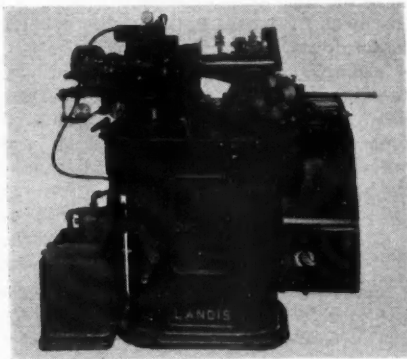
Hilo Varnish Corp. has announced the appointment of Everitt J. Cole as industrial sales manager. Mr. Cole was formerly chief chemist of the corporation.

NEW DEVELOPMENTS

Automotive Parts, Accessories and Production Tools

Landis Ball Race Grinder

An improved ball race grinder just announced by the Landis Tool Co., Waynesboro, Pa., includes, in its design, all of the desirable features found in former Landis machines of the same type. But in addition it has been completely motorized and a sizing device has been added. The result is an economical machine for grinding outer ball race grooves on a high production basis. It may also be used to grind inner ball race grooves. Certain other types of miscellaneous radial grinding also come within its range.



Operation is semi-automatic. After loading the work and swinging the sizing device around to its operative position, the operator moves the wheel into the work and starts grinding. The automatic wheel feed mechanism feeds the wheel in steadily from this point, advancing it a predetermined amount twice within the space of one oscillating movement. When the raceway is almost down to size (say within .001 in. although this figure may be changed at will) the automatic wheel feed mechanism is disengaged by means of a solenoid controlled by the sizing device. The remaining stock is quickly removed without a further feeding in of the wheel and just as soon as the raceway is down to exact size the wheel moves back a few thousandths from the work. This also takes place automatically, being controlled by a solenoid which is actuated by the sizing device. Now the operator gives the feed up hand wheel an approximate half turn clockwise, moves the wheel away from the work and reloads.

The grinding wheel spindle runs in duplex type preloaded precision ball

bearings. It is driven from a jack-shaft which receives its power from a short driving drum at the rear of the machine. The grinding wheel feed can be adjusted to reduce the diameter of the work from 0.00025 in. to 0.0015 in. at the end of each half stroke of the oscillating work head movement. The conventional Landis feed up hand wheel is used.

The work carrying head is automatic in its oscillation and is provided with adjustments for varying the length of arc of oscillation.

The sizing device is mounted on the work carrying head at the rear. It may easily be swung into and out of operative position. When doing this a slight downward pressure at the top of the device lowers the diamond tipped finger sufficiently for it to clear the groove. A dial indicator graduated in tenths of a thousandth is used and convenient adjustments are provided enabling the operator to change the point at which the feeding in movement stops.

A 2 hp. 1150 r.p.m. constant speed electric motor mounted at the rear drives the entire machine. Through the use of a two step driving pulley two work speeds and two work head oscillating speeds are made available. A lever at the front of the bed disengages all of the drive excepting the grinding wheel rotation when it is desired to change the work. The net weight of the machine is 2000 lb.; floor space required 31 x 56 in.

New Alfite Auxiliary Unit

To meet the demand for a wall unit to supplement installed fire protection systems, the new Alfite carbon dioxide unit, known as a Type H, is offered by the American-La France and Foamite Corp., Elmira, N. Y. This unit is used to protect specific localized risks.

Dip tanks, drain boards, spray booths, paint and solvent storage and many other risks in industry are now protected with Alfite or other fire protection systems, but this protection is frequently limited to the risk itself. The Alfite unit type H provides auxiliary flexible protection for nearby property.

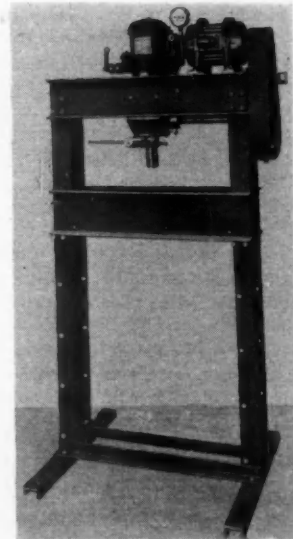
This unit is available in eight combinations having one or two 50 lb. Alfite cylinders, hose lengths of 50 or 100 ft., and having either local or remote control. In the case of a remote control unit, the discharge tube,

hose, racks, pull box and instruction plate are shipped mounted on a board which can be fastened to a wall. In case of fire, a single short pull on the handle of the pull box releases the fire smothering gas from the remotely located gas cylinder or cylinders.

Alfite gas quickly snuffs out fire by reducing the oxygen content of the atmosphere to a point where it will not support combustion. It kills fire in seconds and then disappears. There is nothing to clean up, no damage to electrical equipment, instruments, machinery, materials in process, or human life. It does not deteriorate nor freeze.

Hannifin General Utility Presses

The new Hannifin-Vickers Hydraulic Press has recently been announced by the Hannifin Manufacturing Co., Chicago. This is a general utility press, which will be furnished in two types—hand operated or motor driven—and in three sizes—20-ton, 40-ton and 60-ton. A distinctive feature of this press is that the entire operating mechanism, including the cylinder pump, valves, and reservoir is combined in an integral unit. These presses are regularly furnished with frame construction as illustrated, but where desired, the complete self-contained power unit may be purchased separately. Also, the power unit can be furnished mounted on an open gap frame. The standard frames are so constructed that the motor drive can be added later.



This company also is prepared to furnish high-speed hydraulic presses up to 100 tons capacity. These are furnished in three sizes—2-column, 4-column, and open gap types, and are equipped with the well-known Vickers hydraulic pump and control valves.

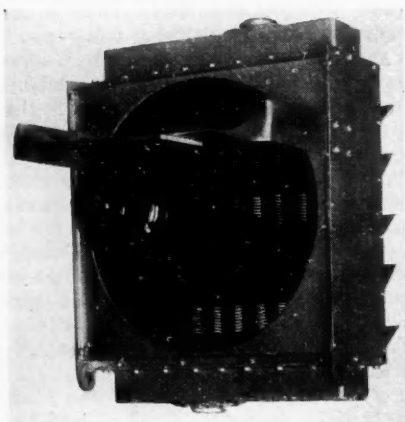
(Turn to page 932, please)

NEW DEVELOPMENTS

Automotive Parts, Accessories and Production Tools

McCord Unit Heater

A unit heater embodying a number of interesting features, including ease of installation, lower service cost, high efficiency, and decreased noise and vibration, is announced by McCord Radiator and Mfg. Co., Detroit. It is of the high air capacity type, providing efficient functioning even at low heater temperatures.



The heat transfer unit is composed of a series of copper tubes provided with large spiral fins, each assembled individually into the header tanks, making it possible to replace a single tube assembly without requiring an entire new core. The copper tubes are extra heavy and the spiral fins are formed from sheet stock in such a manner, by crimping the inner edge, that the contact area with the tube is equal to the outside periphery of the fin, for greater heat transfer to the fin edges.

Tubes are fastened into the top and bottom header tanks by brass compression nuts with tapered threads, and a gasket below the nut. The tapered thread is effective in compressing the nut around the tube for a more effective seal. After assembly each nut and tube in the top header tank is drilled diagonally with a small drill to provide a drain for water accumulation while the unit heater is not in use.

The unit heater is offered with any type of motor desired, including explosion proof types. Motor suspension is of the two point type, facilitating interchange of motors, and also as is claimed, tending to reduce vibration.

A balanced suspension has been worked by hanging the heater from the side plates to remove strain on the pipes and fittings. Another feature is the use of a short shroud. The latter being found to be more effective than the deep shroud type since it permitted in-flow of air at the fan blade tips.

New Carbide Alloy for Cutting Steel

A new cemented carbide cutting metal, Widia "X," for machining steel has been placed on the market by Thomas Prosser & Son, 15 Gold Street, New York.

This metal was developed by Fried. Krupp A.G., of Essen, Germany, at the request of the Prosser company, to meet the demand of American industry for a hard cutting composition which would be successful for machining steel.

It is stated that the new composition permits increases in cutting speed when machining steel as great as those which can be obtained on cast iron or non-ferrous materials with cemented tungsten-carbide. This tool does not take the place of tungsten-carbide, but is offered as supplementing existing tool materials.

Full details of the composition of the new material are not yet available, but it was learned that it is a unique mixture, embodying a rare metal carbide not previously used. It is manufactured by coating the cutting particles with a softer material which acts as a binder, thorough mixing to obtain a homogeneous and uniform mass, pressing together under enormous hydraulic pressure in a mold, and finally sintering at high temperature in an inert atmosphere in an electric furnace. This cementing process is similar to that employed in the manufacture of Widia cemented tungsten-carbide, and produces a uniform product free from any traces of blow-holes or other defects. It is understood that patents are being applied for by Krupp on the new metal.

Copper brazing to shanks can be done by the same methods as are employed for brazing tungsten-carbide; however, the complete tools, as made by Prosser, embody special high grade steel, and the tips are brazed by a special process, overcoming many difficulties previously encountered with tipped tools.

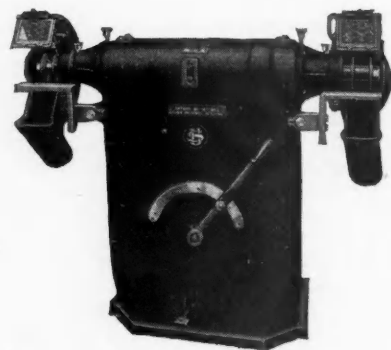
The application of the new Widia to lathe type tools and milling cutters, as well as tool angles, are, as far as known at present, the same as with Widia cemented tungsten-carbide; the forms of the tips and the price are also the same.

The grinding of Widia "X" is at least as easy as the grinding of tungsten-carbide, and the wheels and methods of grinding which are employed for tungsten-carbide are applicable to the new tools. It is necessary in some cases to grind chip breakers in the tools; in this case care should be taken not to hollow grind the chip breaker, but rather to grind it parallel to the top surface of the tool with a small radius at the back to form the chip.

Smaller Model "U.S." Grinder

In response to a demand for a smaller model of their "variable speed" grinder, The United States Electrical Tool Co., Cincinnati, is now announcing the new Model 64. A feature of this machine is its ability to maintain a constant wheel surface speed regardless of wheel wear, using wheels clear down to the flanges.

Constant speed is achieved by means of the patented Gibbs V-Disk Transmission of graphitized micarta embodied in this grinder. As the wheel wears, the operator shifts easily and almost instantly into the next spindle speed by means of the convenient hand lever and foot pedal shown on the front of the grinder. The speed lever is interlocked with the wheel guards, making excessive speeds impossible.






The machine is supplied in four sizes to accommodate wheels 12 in. x 2 in., 14 in. x 3 in., 18 in. x 2 in. and 20 in. x 2 in.—for 220, 440 or 550 volts, 25, 30, 40, 50 and 60 cycles, 2- or 3-phase alternating current.

Molybdenum Cushions Tantalum Carbide Tools

A new method of applying carbide tips to cutting tools has been perfected by Mamet Corp. of America, North Chicago, Ill., and is now being used.

(Turn to page 934, please)

 "Disc wheels for me"
  "I want wire wheels on my car"
  "I'll stick to the artillery"

Yet all can have wheels of steel

Steel is the universal material for wheels to-day. But all motorists do not agree on the type of steel wheel to use. Budd, by recently perfecting the steel artillery wheel, is now able to meet this difference of opinion with a steel wheel to satisfy every preference. And each type is interchangeable on the same hub. Budd Wheel Company, Detroit, Philadelphia.



BUDD-MICHELIN WHEELS

STEEL DISC

(Lacquered or stainless steel.)

STEEL WIRE

(With painted spokes, stainless steel spokes, stainless steel sheaths, or Snapspokes.)

STEEL ARTILLERY

(Lacquered, chromium plated, or stainless steel.)

NEW DEVELOPMENTS

Automotive Parts, Accessories and Production Tools

in many of the tantalum carbide tools manufactured by this company and its licensees.

An insert of pure molybdenum is brazed between the steel shank and the tantalum carbide tip. Molybdenum having almost the same coefficient of expansion as Ramet, its use effectively prevents strains being set up or cracks developing in the cutting tips as tools cool after the brazing operation.

Such strains as may develop between the molybdenum insert and the steel shank are entirely absorbed by the molybdenum, due to its great ductility.

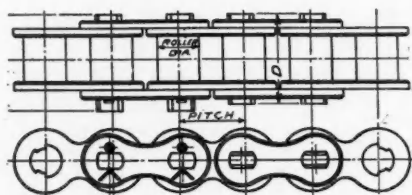
Molybdenum inserts are said to be desirable in tools where the carbide tips are long, thin, or of unusual shape; or where unusually severe conditions of operation are expected.

In small tools the tantalum carbide tip is now often mounted on a shank of solid molybdenum.

New Morse Roller Chain

Morse Chain Company, Ithaca, N. Y., is now marketing a roller chain with an original joint construction.

Within the roller there are two joint members, a segmental bushing and a pin. The cross section of the pin is that of a round pin integral with a segmental bushing. On account of



Section of Morse Roller Chain

this construction, when a chain is flexing on or off a sprocket, all sliding movement of surfaces under load is between the pin and its bushing, or, specifically, no movement under load occurs between the roller and the joint members. This feature is claimed to insure uniformity of pitch throughout the life of the chain, and, therefore, smoother and quieter operation.

The open spaces between the joint members provide reservoirs for oil, and lubrication is made more effective by the "pumping" action when flexing.

Morse roller chain is made to manufacturer's standards and is interchangeable on all standard roller sprockets.

New Sizes of Cameron Motorpump

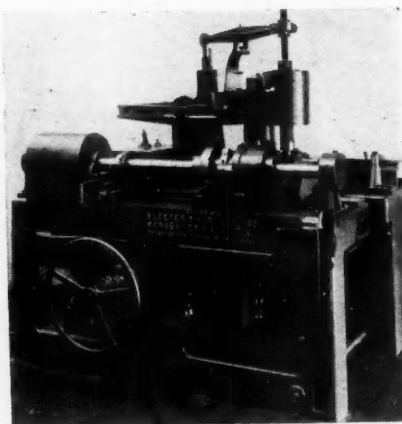
Some new sizes have been added to the Cameron line of small general service centrifugal Motorpumps made by the Ingersoll-Rand Co., New York City. These pumps are now made in one-inch discharge and upward. They are used against moderate heads for a great variety of services, such as in circulation systems, air conditioning equipment, standpipe and water supply systems, condensate return systems and general transfer service handling a wide variety of liquids.

Pump and motor are assembled as a single unit with a common shaft, producing a compact, lightweight pump which requires little floor space and can be easily installed. No foundation or baseplate is needed. The discharge nozzle may be turned to any one of four positions.

Torsion Spring Machine

Shipped to the Soviet Government where it will go into production work immediately at the Autostroy Doskino plant, the new No. 2½ torsion spring winding machine, just completed by Sleeper & Hartley, Inc., Worcester, Mass., designers and builders of spring coiling and wire-drawing machinery, is of novel construction.

This machine coils wire ranging from No. 14 (0.0800) to ¼ in. In the smaller wire sizes it will produce springs with up to 50 coils at 20 springs a minute, while in the larger wire sizes, 25 coils may be wound into a spring at 10 springs per minute.

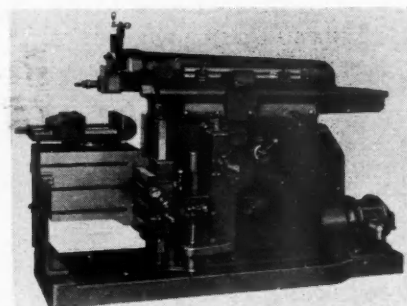


Regardless of wire size, projecting ends up to 7 in. and 12 in. long may be left on either or both ends of the spring body, and in some cases these ends may be formed automatically as they come from the machine. Coils up to 4 in. O.D. may be produced.

A wide field of utility is embraced by this machine which should find particular use in the automotive, agricultural implement, tractor and other plants. Occupying but 6 in. by 4 ft. 6 in. the machine effects a great saving in floor space over previous types.

Rockford Hy-Draulic Shaper

Following a program of development in hydraulic machine tools, the Rockford Machine Tool Co., Rockford, Ill., now has placed on the market the new Hy-Draulic Shaper with hydraulic power for both ram drive and feeds.



It has an unlimited range of quickly adjustable speeds from 0 to 120 ft., and cross feed from 0 to 0.160 in. Return speeds are said to be higher than usual commercial practice with a ratio of 1 to 3.73 of cutting to return stroke. The controls are centralized and the simplified operating adjustments are made without the use of tools. The machine is capable of 150 strokes per minute with a maximum stroke of 25 in.

Motor drive is of 10 hp. 1800 r.p.m. Floor space required is 48 x 99 in. Net weight 6200 lb.

3/16-Inch Pitch Silent Chain

What is said to be the world's smallest silent chain drive has been announced by Link-Belt Co., Indianapolis, Ind. It is a ¾-in. pitch silent chain made in three types—Middle Guide, Side Flanged, and Duplex. The Middle Guide and Side Flanged chains are employed where all shafts are driven in one direction, and the Duplex chain where reverse direction is desired on some shaft or shafts, or where adjustment features are desired.

The "X" type pin (patent applied for), assures a chain joint, in this size chain, that will give long and efficient service.

(Turn to page 936, please)

IT IS POOR ECONOMY

To Use Anything But

ORIGINAL GEAR SHAPER PARTS

in Your Fellows

Gear Shapers

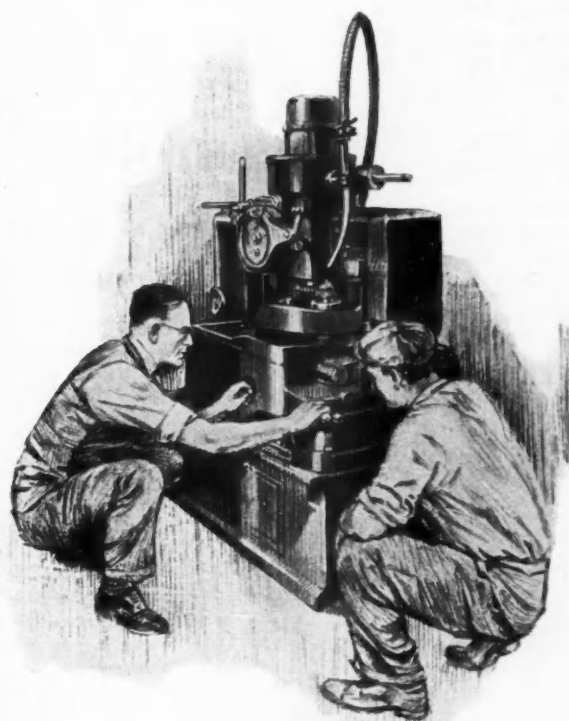
The Fellows Gear Shaper is a highly-specialized product, and to function satisfactorily must retain its original accuracy. In view of this fact, it is poor economy to use anything but original Gear Shaper Parts in your Gear Shapers, when repairs are necessary either through neglect or wear.

Accurate and proper functioning parts are the back bone of any mechanism, and this is particularly true of the Gear Shaper. Naturally, we know what is required either in the nature of material or accuracy, and furthermore, cannot be held responsible for the improper functioning of parts that we did not make.

By placing the entire responsibility upon us you are assured of the most satisfactory results at the lowest cost to you. Do not jeopardize your reputation for the sake of a small initial saving. It is always the accumulative results that count.

The Fellows Gear Shaper Company,
78 River Street, Springfield, Vermont,
U. S. A. (616 Fisher Building, Detroit,
Michigan).

Automotive Industries



Accurate and proper-functioning parts are the backbone of the Fellows Gear Shaper. We have a staff of experts who thoroughly understand these machines—call on them when you are in need of assistance.

FELLOWS

~ GEAR SHAPERS ~

December 12, 1931

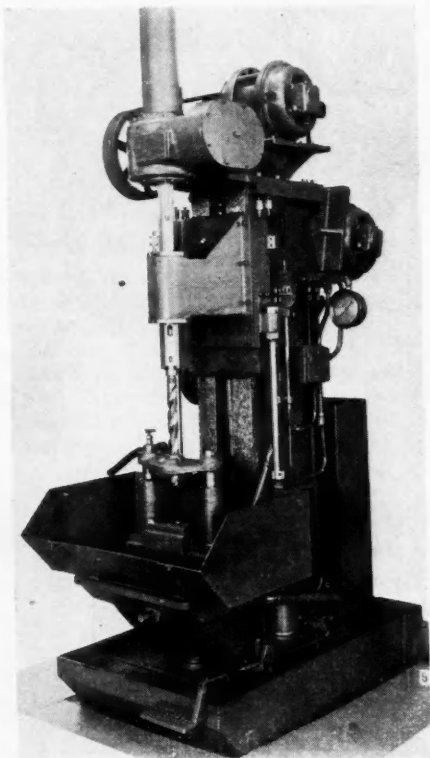
NEW DEVELOPMENTS

Automotive Parts, Accessories and Production Tools

Oilfeed Drilling and Boring Machine

Another addition to the line of hydraulic feed machines of Baker Bros., Inc., Toledo, Ohio, is the No. 4-VH, oilfeed drilling and boring machine. It is adapted for either single spindle drilling or boring, as shown, or for use with an indexing table for successive operations on the same piece.

The saddle which carries the head mounting slides on carefully scraped ways and is actuated by the Baker



patented "Twin Pull" construction which consists of a cylinder mounted on each side working in unison.

The drive is from a motor with multiple "V" belts to a drive bracket carrying four gears. Two of these gears are slip change spur gears which are readily changed to give different speeds and one pair of spiral bevels. The speed changes available from the combination of gears that can be furnished range from a minimum of 46 r.p.m., which represents a 60 ft. cutting speed on a 5 in. diameter, up to 836 r.p.m. which represents a cutting speed of 70 ft. on a

5/16 in. diameter. The motor recommended depends on the work upon the machine. The machine has ample capacity to transmit up to 10 hp. on the spindle drive.

Alumaweld Solder

Alumaweld, a solder for aluminum and other metals, has been placed on the market by the Allied Research Laboratories, Glendale, Calif. Judging by preliminary tests in the repair field this product should be of great value in body repairs, in production, in factory maintenance and other repair operations of a salvage nature.

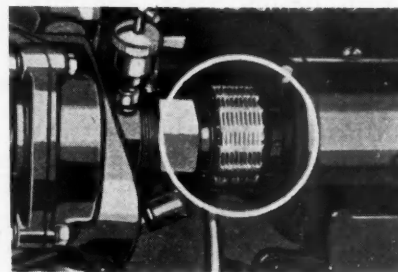
Alumaweld is applied with an ordinary soldering iron or blowtorch. No flux is required for aluminum, pot metal or die castings, while a special

flux is available for cast iron and steel. It melts at a low temperature, but has a higher remelting point.

Alumaweld has a tensile strength of 12,000 lb. It is hard enough to be worked or machined easily, and is very ductile, taking a nice polish over which chromium or any other plating can be applied.

Morse Flexible Coupling

The Morse Chain Co., Detroit, has placed on the market a flexible coupling for driving such engine accessories as water pumps and generators. This coupling, which is illustrated herewith, compensates for both parallel and angular misalignment of connected shafts.



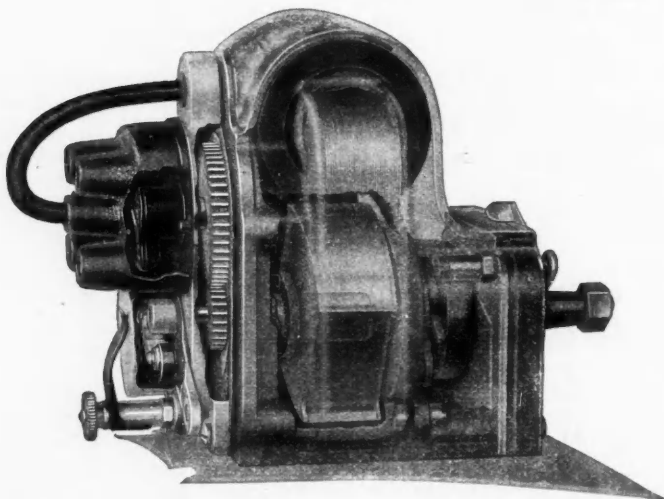
Wico Rotating Magnet Magneto

Wico Electric Co., Springfield, Mass., which in the past has manufactured magnetos chiefly for stationary engines, has recently developed a rotary-magnet magneto for use on tractors, trucks and marine engines with from two to six cylinders.

The rotating magnet surrounds a stud on which it virtually floats. This

that the rotor cannot be subjected to side strain due to improper mounting, owing to its independent journaling.

The two-piece assembly frame, which incloses the distributor gears, acts as a reservoir for lubricating oil. The oil is freely circulated over the gears, the stud on which the rotor is mounted, and other bearing surfaces. A jump-spark distributor and breaker mechanism of the conventional automobile type, so mounted as to be isolated



is claimed to assure continued maintenance of the air gap dimensions. The magnetic core is 1 in. in diameter, which is said to be unusually large. A conventional impulse coupling is mounted within the housing and can be readily serviced without disturbing the generating parts. It is claimed

from the lubricated surfaces, completes the assembly.

This magneto divides naturally into seven unit assemblies. All parts of both the high and the low tension circuits can be readily checked up. A strong spark is said to be generated at low speeds.